REPORT RESUMES

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HELPING TEACHERS CHANGE THEIR BEHAVIOR.
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THE OBJECTIVES OF THE STUDY WERE TO--(1) INTRODUCE SOUND FILMSTRIPS AS AUDIOVISUAL AIDS FOR INSERVICE TEACHER TRAINING AND (2) EVALUATE AN INSERVICE PROGRAM IN TERMS OF CHANGES IN SPONTANEOUS TEACHER BEHAVIOR. FIFTY-ONE TEACHERS (DIVIDED INTO TWO GROUPS OF AN INSERVICE TRAINING PROGRAM) WERE OBSERVED IN THE FALL BEFORE PARTICIPATING AND IN THE SPRING AFTER THE PROGRAM. RESULTS SHOWED THAT THE TEACHERS WHO HAD THEIR OWN IDEAS AND COMMENTS INTEGRATED INTO THEIR PROGRAM--(1) ENGAGED IN MORE EXPERIMENTATION AND (2) APPLIED MORE INDIRECT, OR FLEXIBLE, PATTERNS OF TEACHER INFLUENCE IN THEIR CLASSROOMS. BY USING INTERACTION ANALYSIS ON TEACHER ACHIEVEMENT AND ATTITUDE, IT WAS DETERMINED DESIRABLE TO HAVE A FEEDBACK TO ASSESS THE DEGREE OF TEACHER INFLUENCE. IN ADDITION, THE MOST CONSTRUCTIVE TEACHER INFLUENCE APPEARED WHERE THERE WAS AN OPPORTUNITY FOR INDEPENDENT AND SELF-DIRECTED INQUIRY IN THE CLASSROOM. THE INFLUENCE OF SUCH OTHER FACTORS AS MORALE AND PRESENTATION CONDITIONS PREVENTED EVALUATION OF THE FILMSTRIPS IN ANY ABSOLUTE SENSE. (PM)

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HELPING TEACHERS

CHANGE THEIR BEHAVIOR

An inservice training project utilizing

-- sound filmstrips -- interaction analysis
-- self-directed experimentation

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In general the research team at Minnesota conducted the research and was concerned with the tabulation of data. The team at Michigan provided the review of the literature, the statistical analysis, and rough drafts of the terminal report. The cover was designed by Sally L. Sprague and all layout was done by Kathleen J. Farrell.

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NAF, Ann Arbor, 1963

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Chapter One

THE INSERVICE TRAINING PROJECT

Some Preliminary Considerations

Most teachers take a stand regarding such issues as "democratic versus authoritarian", "progressive versus non-progressive", "content-oriented versus student-oriented", "creative versus noncreative", and a host of others. Actually these issues reflect the tendency of the debater to contrast two extreme positions while ignoring that acts of teaching are highly variable. Patterns of teacher behavior are constantly being modified and adapted to meet the demands of complex, ever changing situations. The implicit assumption behind all the arguments is that the outcome will somehow affect how teachers act while teaching. Yet very little research, if any, has shown that a reasonably large sample of teachers who adhere to a set of values, say those expressed by one controversial camp, consistently act differently than another equally large sample of teachers who "belong" to another camp.

Quite the contrary, we have more research that shows that the personal attributes of teachers, their personality characteristics, attitudes and values, show very little correlation with a variety of criteria of teaching performance. Ryans (28) wrote a whole book on the subject and one member of our staff (12) discovered that the most promising eight scales among 25 from several personality tests provided scores that were not significantly related to patterns of verbal influence as assessed by interaction analysis.

In Minneapolis, during the early 1950's, there was considerable public controversy about whether English and social studies should be taught in single hour classes by "traditional methods", or combined into a core program of two-hour "Common Learnings" periods taught from a point of view that has been well described by Bossing (5). Anyone reading what has been written about core teaching would assume most reasonably that the influence patterns of such teachers would be systematically different from teachers who taught single hour classes. In a few classrooms there were dramatic differences of content and practice, but a representative sample of both types of classroom revealed non-significant differences when teacher influence was assessed by interaction analysis. In another study, Flanders (16) has shown that there were no significant differences between the two types of classes in basic skills as measured by standardized achievement tests. Yet these issues were very real to those concerned and controversy regarding them still continues.

From the research accomplished so far, some of which will be reviewed in this chapter, it seems clear that teachers do have different attitudes toward teaching and philosophical values about education. These differences have been measured. Yet research to date has produced remarkably few significant relationships between such measures and various criteria of teaching performance.

During the last decade, those who have struggled to develop methods of quantifying the qualitative aspects of spontaneous teaching behavior have eagerly hypothesized relationships between teaching behavior and various attributes of teachers, yet such relationships are disappointingly low. These findings lead to an inevitable conclusion, namely, in many classrooms there is a significant discrepancy between a teacher's intentions -- what he will acknowledge as his purposes or values -- and his actions while teaching -- what we can assess as overt behavior.

On the other hand, relationships between patterns of overt teaching behavior and two significant criteria of teaching effectiveness have been established in one carefully controlled field experiment (16). In this project, which preceded the present effort, seventh grade, two-hour, combined English-social studies and eighth grade, single hour, mathematics classes were studied. In both subject matter fields significant differences among the spontaneous verbal patterns of teachers were found which permitted us to identify two contrasting groups in terms of how the teacher acted while teaching. The teachers who were more indirect were predicted successfully for the contrasting groups according to more constructive pupil attitudes toward the teacher and toward schoolwork, and higher content achievement in which the gain scores were adjusted for initial ability. The differences were shown to be consistent with a theory of flexible teacher influence and its effects on attitudes and learning.

In choosing an approach to the inservice training of teachers, what better goal could there be than to help teachers actively investigate relationships between their own actions and the reactions of their pupils? In effect, our objective was to reduce the discrepancy between the intentions of the teacher and his overt behavior while teaching.

A Review of Other Inservice Training Projects

One way to develop a perspective for the project about to be reported is to review other inservice training projects reported in the professional journals. The following represents a summary conducted in the summer of 1962.

Inservice education encompasses the whole area of teacher-growth or re-education: "it is that basic orientation of attitudes, aims, and aspirations that is essential for a reconstruction of concepts and practices." (37). It thus is more than an occasional workshop; it is a continually growing dynamic part of the teaching profession. From its earliest beginnings with Horace Mann in 1845, inservice education has been a topic of major interest with educators. All areas - from extension courses to summer "travel-broadening" experiences - have received comment. In this brief overview of the latest literature on inservice training programs, three major points of emphasis have been stressed:

(1) the evidence of older trends still existent: "the talking stage"; (2) the change from subject-matter orientation to classroom climate and attitudinal change; and (3) present research emphases: "the doing stage". The literature reviewed here takes in only the brief time period from 1950 to the present, because of the obvious limitations of space and because of the reiteration of opinionated studies previous to this date. This section ends with an emphasis of this study, and why it appears to be a logical next-step from previous work in this area.

Older Trends.

Mork (26), in an unpublished doctoral dissertation at the University of Minnesota states that the bulk of studies on inservice education up to 1953 show "opinion and recommendation rather than research". His use of achievement data as a means of evaluating an inservice training program was an attempt to counteract this trend. Although evaluation of types of inservice training was valued as important, the general form of measurement was primarily, at this time, by means of subjective questionnaires and rarely by pupil achievement. No recordings of actual teacher-behavior change was evidenced. This view is also supported by Curtis (11) in the 1958 edition of the Review of Educational Research. During the five-year time span from Mork's work to the publication of Curtis' survey, there appeared to be a growing emphasis on teacher needs, but again research was primarily on the opinion level. Most of the writing during this earlier period centered itself on the forms and problems of inservice education as a first step to actual experimentation. Some examples of these articles include Loughran (25), Schaaf (30) and an editorial in the Elementary School Journal, 1953 (31). Schaaf emphasized the importance of continual growth for the teacher. She recognized the problem of fitting the program to the school in question and listed thirteen means for educating the teacher inservice. These included a large range from philosophy to subject-matter to action research. A deploring lack of evaluation is recognized as early as 1953 and suggestions for "guideposts" to proper evaluation are proposed. The general trends in these articles are toward a growing realization on the part of educators of the problems and importance of the manifold aspects of inservice education. They have laid the groundwork, so to speak, for more recent educational philosophers and psychologists to take up the idea that inservice education means more than merely acquiring new knowledge, and must include also an actual change in teacher behavior. Unfortunately the pervasive feeling that surrounds the reader after surveying these opinions is one of their quiet resignation; is this topic like the weather, or can something be done about it?

Changing Emphases in Inservice Education.

A change in perspective has been growing over a period of time and has not come all at once. If we examine the literature from 1958-1960 influences of the earlier work in inservice education have merged with newer concepts. This trend demonstrates a growing interest in the breadth of the possibilities of inservice education programs, in practical issues and in the current needs of these programs. Eggert (14) indicates the diversity necessary for programs of inservice training. They must reach from subject-matter fields to student activities and guidance programs. The objectives should be an understanding of the basic philosophy of the school by all departments and faculty, as well as how this philosophy can best be carried out. Ashby (3) presents practical, economic issues: the school board must adopt "policies which encourage individual improvement".

Savignono (29), Hedges (18), and Wagner (35) were also interested in these practical matters, but centered their attention more on the teachers' acceptance and ability to evaluate himself. Savignono lists eleven ways that the individual teacher can employ self-evaluation to better his own teaching style and content. In Morehouse Parish, Louisiana, Vera Lee Hedges points out the growing stimulative effect of action research done by individual teachers. In these attempts it is the personal involvement of the teachers themselves that insures the success of the projects, "It is this excitement (of the teachers) which goes over to the children", Wagner indicates. He finds that these self-research-evaluation concepts are invaluable to the professional growth of the teachers involved. Cooperation and teacher initiation are crucial to the success of these programs, Alexander (1) states. He feels the adjacent teacher-training institution can give the greatest help to in-service growth if the "team-approach" is effectively employed.

Teachers are also becoming interested in student needs (10). Summer workshops at Leyden High School in Illinois have dealt with the better understanding of children's needs; and from these workshops outgrowths such as student-teacher planning, core programs, family-life education, and guidance have evolved. In this area 90% of the participants were in favor of the programs. These broadening interests seem hopeful, but to many there remains much to be done in the area of inservice education. "It should involve the total school community...The program must meet the teachers' demands, they should be involved in the whole business, they should practice good human relations, variety, freedom of choice, plus a recognition of growth and evidence of progress...Assessment is needed." (21). "In these reports no information is given as to what effect the classes, visits and demonstrations had on the attitudes and understanding of participating teachers, or on the instructional practices and the programs of the schools involved...No appraisal of the value of these work products to meet teacher needs or to improve educational programs was reported." (19).

One can hardly suppress that "ho-hum" reaction to articles such as these which extol virtue and condemn sin. The unrestricted "involvement of the whole community" may actually detract from the inservice enterprise. Those not actually participating should be involved only to the extent necessary to accept and support inservice training programs, since an atmosphere of mutual trust and respect is needed. Beyond this point lies the danger of too many committees and too little action. Again we are impressed by the superfluity of "arm-chair philosophers".

A Sample of Previous Research that has been Completed.

In this next section several recent research studies are reviewed to illustrate the emphases of earlier research on inservice education.

In 1950 Kelley (22) reviewed 20 studies of inservice education done over the past thirty years. Most of these were surveys and questionnaires. None of these studies reported any follow-up or thorough experimentation.

Four studies reported by Cory (9), Krebs (24), Kopp (23) and Willink (36) demonstrated by use of questionnaires that inservice training was favorably accepted. Cory was able to construct a statement of objectives of inservice programs through his inquiry. Krebs, working in Bristol Township, Pennsylvania, considered evaluation as an on-going, dynamic process; and using a one-hundred point satisfaction scale observed a subjective positive feeling from teachers, administrators, and laymen on the inservice training program. Evaluation of an inservice improvement program at the Fashion Institute of Technology was made through subjective reports. Kopp and Snyder concluded that participants were in favor of the program. The fourth study was done in New York State in 1957-58 by Ross J. Willink. This was an inquiry into the status of inservice training of teachers in the junior high schools of New York State. Questionnaires were sent to administrators and to teachers alike and some significant findings resulted: large high schools near universities had more training opportunities; although more women feel the need for training, more men participate; 96.6% of the schools contacted had programs and 22.4% of these were required by the system. After studying these and other findings Willink proposed a list of fifteen recommendations including more inservice evaluation.

Serious questions can be raised about the practical importance of surveys which presume to report a favorable reaction of educators toward inservice training. Most of these studies fail to get at the heart of the matter which is to determine what kinds of teachers like or dislike what types of inservice training, or what aspects of an inservice training program. Furthermore it has been shown in studies on the reliability of both opinions and sociometric choices that the results may be quite different when the reactions reported are presumed to have, or will have, direct consequences for the person giving the report. It is one thing to be in favor of inservice training and quite another to assign a part of your working day, during the next ten weeks, to inservice training activities.

An interest in classroom socio-emotional climate starts on its upward trend in a study by Perkins (27), whose work, in turn, was stimulated by H. H. Anderson and John Withall. He found that by using subjective ratings and a Chi-square test of significance that significant relationships existed between group learning and patterns of interaction in the training groups. The evidence suggested that this increase was due to the more positive classroom climate affected by the leader of teacher discussion groups.

Four studies done at about the same time as Perkins' work show an increase of interest toward group dynamics and the emotional needs of children. Fleming (17) showed significant changes in the actual behavior of children whose teachers participated in training periods: More children came to school more often after their teachers had completed training. In a controlled study Dysart (13) showed that children made greater gains on the Wrightstone teacher-pupil rapport scale when teachers trained in sociometry were compared with untrained teachers. Gains in achievement of pupils of teachers who were exposed to training in group processes and the emotional needs of children were noted by both Beauchamp (4) and Burrell (8) in independent studies. These gains were attributed in both cases to improved classroom climate.

Brandt (7), simularly considering the emotional needs of children, reported findings contradictory to those previously mentioned. Teachers participating in child-study programs at the University of Maryland's Institute of Child Study did not significantly affect their pupil's reading and arithmetic achievements, but their training did result in more positive ways of working with children and more democratic classroom organization.

In 1961 Houston, Boyd and Devault (20) reported an inservice training program in mathematics for intermediate grade teachers. Working with 233 teachers in Austin, Texas, they carried out five weekly one and one-half hour sessions on content and method using television, lectures, discussion periods, and individually written topic reports. A significant proportion of teachers (77%, X^2, $p = .01$) reacted positively to the program, and 74% used the material covered in the sessions in their own classrooms. This utilization of training materials was the primary method of evaluation.

These more recent studies illustrate the trend toward some kind of evaluation of inservice training activities. Their major inadequacy is that too often teacher perceptions are reported which would obviously be biased by the teachers' general reaction to the program. Interest in changes in the classroom behavior of a teacher was not evident in these studies.

Research in Progress.

At present many studies are being done which promise to provide more solid information than the previous research (2, 34). Several of these are expressly concerned with the effect of television as a new medium in inservice training. The United States Department of Health, Education, and Welfare has granted funds under the N.D.E.A. to four projects with their emphasis on the use of new media in inservice training programs: "Experimental Development of a Mobile Laboratory of New Media of Instruction for Use in the Inservice Education of Teachers of Science and Mathematics" headed by John S. Richardson of Ohio State University; "A Study of the Relative Effect of Selected Approaches to the Inservice Education of Teachers in the Utilization of In-School Radio and Television Broadcasts" led by Merle W. Glasgow of the University of Oklahoma; "A Demonstration of Inservice Teacher Training in Audio-Visual Education via Television and related Means" headed by Walter A. Wittlich at the University of Wisconsin; and "A Survey to Determine the Feasibility and Desirability of Using Television as an Instrument of the Inservice Education of Teachers in Puerto Rico" headed by Augusto Bubonis of the University of Puerto Rico.

A project headed by Bowers and Soar (6) shows a new attention to the development of theory in human relations training for teachers. They have experimented with laboratory training in human relations by using attitude and personality data, biographical data, classroom observation, and diaries of classroom activities. The concern here has changed from attention on teacher attitudes to assessment of behavioral change in classroom behavior, a welcome trend. To date the result of Bower's and Soar's work has supported the following conclusions: there is a change in the concept of educational leadership held by teachers after intensive laboratory training; trained teachers changed their attitudes toward pupils and toward a more democratic ideal of educational leadership. They hypothesized that because they used teachers who "volunteered" there were fewer significant differences due to the narrow range of individual differences in a volunteer group as opposed to the parent population, and due also to the Hawthorne Effect which tends to limit differences. The Johnson-Neyman technique was used to compare subgroups because these mean differences were so small. However, significant changes were found in the areas of verbal emphasis, social structure and emotional climate - teachers with training decreased on the use of the former, and seemed to produce a freer structure and more positive climate. Teachers who were immature or who perceived their surroundings inaccurately did not profit from the training. Group problem-solving skills improved significantly for other teachers who perceived the training more accurately, as did the social skills of their pupils.

B. O. Smith (32) has spent the last few years at the University of Illinois studying a possible logical framework for a theory of teaching. One part of his prospective research is to find out whether teachers trained in the logical dimensions of instruction will exhibit more logical teaching behavior as compared with teachers who are untrained. At present Smith's work (33) has centered on refining these logical dimensions and defining a classificatory system for observers.

The Emphasis on Changes in Classroom Behavior

This project provided inservice training for junior high school teachers in which the emphasis was on making changes in classroom behavior. The phrase "changes in classroom behavior" means acting differently while teaching. It is to be distinguished from efforts to change a teacher's attitudes, his values or simply increasing his knowledge about teaching which may or may not be implemented in classroom practices.

Helping a teacher change his classroom behavior is difficult at best so that an important part of this project was to explore _two different conditions_ of training in order to compare the effectiveness of each one. The two conditions of training were created by conducting, in effect, two different inservice training programs within the same project.

The Objectives of Inservice Training.

There was no training in specific teaching methods since this was not our purpose, and besides, the participating teachers taught in too many different subject matter fields. Instead, the curriculum of the inservice training was concerned with an analysis of how the teacher used his authority in the management of classroom activities. In outline form, the objectives are summarized below; the activities associated with these content objectives will be described later since the _method of training_ was varied in order to create the two different inservice training programs.

A. A teacher controls his own behavior for the purpose of expanding or restricting the freedom of student participation.
    1. Direct influence such as lecturing, giving directions, and criticizing tend to restrict pupil participation.
        (a) This type of influence is most appropriate when it is necessary to focus attention on a particular phase of learning,
        (b) when increased compliance to teacher authority is considered desirable, and
        (c) when, in general, students have accepted the learning tasks,

have made some progress, and have a clear understanding of the learning goals.

2. Indirect influence such as asking broad questions, clarifying and making use of student ideas or feelings, and praising and encouraging student participation tend to increase pupil participation.
   (a) This is most appropriate when new material is being introduced,
   (b) when plans for work are being developed,
   (c) when difficulties are being diagnosed, and
   (d) when, in general, students do not yet understand the learning goals and/or have not accepted the associated learning tasks.

B. Since the action taken by a teacher in a given instance is not always consistent with his intentions, interaction analysis is a tool for assessing teacher behavior; the results can then be compared with intentions.
   1. Teachers were trained as observers so that they could
   2. gain experience in the role of observer-consultant by working with other teachers, and in turn,
   3. benefit from giving or receiving consultation regarding teacher behavior.

C. Teachers were exposed to a school-wide atmosphere of professional inquiry in which the object of inquiry was their own behavior.
   1. Teachers were encouraged to experiment with different patterns of influence and
   2. discover which patterns were most appropriate to particular classroom situations.

Of course, not all teachers reached these objectives and the research team was not entirely successful in meeting its responsibilities. In fact, the design of the project, to be explained in Chapter Two, was such that we expected that a higher proportion of the teachers would reach these objectives in one of the training programs and that a lower proportion would reach these objectives in the other training program.

Some Assumptions About Helping a Teacher Change His Behavior.

First, there is no single pattern of teaching that should be adopted by all teachers. Each teacher must discover for himself his own unique, over-all balance between indirect and direct influence; he must also discover his own rules concerning which patterns of behavior are most appropriate to various learning situations.

Second, fear of professional or administrative evaluation must be eliminated from inservice training in order that teachers will feel free to diagnose their own behavior and explore different patterns of teaching. They must also feel free to ask for help when appropriate. Their objective is greater self control of their own behavior.

Third, participation must be voluntary, insights must be discovered, coercion has no place in the program.

Fourth, members of the training team must not only help teachers identify useful social skills for working with students, but they must be available to help in the classroom when a teacher first attempts to modify his pattern of influence. Such visits to the classroom must be at the invitation of the teacher.

Fifth, members of the training team must avoid making evaluative judgements even when solicited so that the teacher is left to decide for himself what patterns of teaching are good or bad, effective or ineffective. The major function of training is to provide a teacher with more information about his own behavior than would otherwise be available.

Sixth, training activities should be under the control of the teachers or their representatives; full support of the administration will be necessary including the provision of time, resources, and incentives; hopefully, non-participating teachers could maintain at least a neutral reaction or even encourage their colleagues who are participating in the training.

Seventh, in the final analysis, a teacher must want to change before it can occur. In order that his desire for change is self-directed, he must be in a position to control the training activities.

Even though administrative support is essential, the organization and conduct of inservice training is basically a responsibility of the professional teacher.

Needless to say, conditions consistent with these assumptions were not uniformly created in this project, even though considerable progress was made. However, many of the decisions and much of the organization of the project were influenced by the values inherent in the preceding assumptions.

Interaction Analysis, A Tool for Training

Even though interaction analysis was designed originally as a research tool, not a training tool, it can be adapted as a procedure for providing teachers with information about their overt behavior in the classroom (13). If this information is fed back to teachers in a fashion consistent with the assumptions previously mentioned, a teacher has the opportunity to compare his actions with his intentions. We assumed that any reduction of the discrepancy between what a teacher intends to do and what he actually does is likely to result in an improvement of instruction.

The observation technique called "interaction analysis in the classroom" has been described in detail elsewhere (15). Briefly, it consists of classifying verbal communication into ten categories at an average rate of one classification every three seconds. Seven categories are used to classify teacher statements, two categories are used for pupil statements, and the tenth category is used for silence or confusion. The set of ten categories is assumed to be totally inclusive of all statements heard in a classroom. They are mutually exclusive categories since one, and only one, tally is recorded for a single event observed.

The seven teacher categories are divided into indirect statements which expand the freedom of pupil participation and direct statements which restrict the freedom of pupil participation. The entire set of categories is shown in Table 1.1 on the next page.

ERRATA

Pick up a pen and make the following changes in your booklet.

Page

iii, line 1, paragraph 4, change "Hennipin" to read "Hennepin"

iii, line 2, paragraph 7, delete the word "county"

4, line 9, paragraph 2, change "was evidenced" to read "were made"

17, line 4, paragraph 2, change "is" to read "are"

20, last line, paragraph 1, change to read "team and the teachers."

21, line 7, paragraph 2, change to read "group met once a week for. ."

21, line 1, paragraph 3, change to read "After seven of the eight inservice. ."

34, Table 2.1, 3rd column; below "Direct" add I/D, N = 10

35, line 2, paragraph 5, change to read "and 80 of the remaining 88. ."

42, Footnote, line 1, change to read "Special thanks are extended. ."

48, line 6, paragraph 3, change "broadly" to "evenly"

49, line 9, paragraph 2, change "In this project" to read "In the New Zealand project, . ."

49, line 2, paragraph 4, change "a few number of" to "fewer"

49, line 3, and 4, change the sentence "The tallies can be. . .taken over all . . ." to read "Fewer tallies occur because of a short observation period. ."

49, line 5, paragraph 4, change "they fall out of the content cross" to "they occur in categories 1, 2, 3, 6, and 7."

50, line 4, paragraph 3, change "a consistent" to read "possible"

52, delete sentence which reads "Later it will be reported.......compared with the fall."

58, line 5, paragraph 1, change to read ". .Appendix A, p. 145."

77, lines 16 and 17, paragraph 2, change "(There were additional critical statements of. ." to read "(There were additional constructive as well as critical statements by. . ."

85, line 4, paragraph 4, change to read ". .fall to spring for the Saturday and Control groups; and. ."

117, line 2, paragraph 3, change to read "the Saturday compared with the Monday group."

127, line 3, paragraph 3, change to read "to audiences totalling several. ."

132, line 5, paragraph 1, change to read ". .to the Monday program when perceptions of the instructor's behavior was controlled. . .The more"

Table 1.1

INTERACTION ANALYSIS CATEGORIES, (1960)

TEACHER TALK	INDIRECT INFLUENCE	1.*	ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings included.
		2.*	PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, are included. Nods head or says, "Um hm?" or "go on" also included.
		3.*	ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building or developing ideas suggested by a student. As teacher brings more of his own ideas into play, shift to category five.
		4.*	ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.
	DIRECT INFLUENCE	5.*	LECTURING: giving facts or opinions about content or procedure; expressing his own ideas.
		6.*	GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to comply.
		7.*	CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-references.
STUDENT TALK		8.*	STUDENT TALK--RESPONSE: talk by students in response to teacher. Teacher initiates the contact or determines type of student statement. As a student expounds his own ideas, shift to Category 9.
		9.*	STUDENT TALK--INITIATION: talk initiated by students. The ideas expressed are created by students; statement content not easily predicted by previous action of teacher.
SILENCE OR CONFUSION		10.*	NONE OF ABOVE: routine administrative comments, silence or confusion; interaction not related to learning activities.

*Note: The category numbers are purely nominal, no scale is implied.

The observer tallies interaction by writing down one category number for each event so that his record consists of a series of numbers listed in columns which preserves the original sequence of events.

In addition to classifying statements, the observer also makes a notation about the different periods of class activity that may occur during a one hour observation. Five different time-use categories are used for this purpose so that the interaction analysis data can be tabulated separately for each of the following five class activities: first, all periods of routine administration not directly related to learning actions such as settling down to work, cleaning up, passing out or collecting materials, etc.; second, evaluating products of learning such as correcting homework, tests, or hearing reports, etc.; third, introducing material, procedures, and content that are new to the students, including teacher-pupil planning of the learning activities; fourth, all class discussions not included in the first three time-use categories; and fifth, the supervision of seatwork or groupwork activities.

Interaction data are tabulated in a ten row by ten column matrix, each row and column corresponding to the ten categories. Given a pair of numbers, the first designates the row, the second the column. A sequence of original events such as 4, 8, 5, 5 is tabulated in the 4-8 cell, the 8-5 cell, and the 5-5 cell, etc. Each number serves in one sequence pair to designate the column, and in the next sequence pair to designate the row. If a teacher is observed over five or six hours, as we often do for research purposes, a total of six cumulative matrices can be tabulated. Five of the matrices cumulate all interaction that occurred during the five time-use activity periods, and the sixth is the grand total for that teacher.

When this research tool is used as a training tool, teachers are first given enough instruction so that they can tally at a reasonably rapid rate. They are taught how to tabulate their observations into matrices and then given several hours of instruction on how to interpret matrices. Although some attention is given to inter-observer reliability, the standards required for research are not necessary for inservice training. In the present project, about six hours were devoted to learning these skills with the expectation that one teacher would be able to observe another, or at least be able to understand the matrix during a consultation with a member of the training staff. In order to obtain sufficient understanding of these procedures and to read those parts of this report that deal with the interpretation of matrices, the reader is referred to one or more of the references listed at the end of this chapter that pertain to interaction analysis.

There are a number of statistical concepts that are available from a matrix to anyone who is proficient in ordinary arithmetic. For example, the per cent of time the teacher talks, the per cent of time the students talk, and per cent of silence and confusion is readily obtained. It is also possible to calculate the I/D and i/d ratios. The I/D ratio is found by dividing all tallies in categories 1 + 2 + 3 + 4 by the total in categories 5 + 6 + 7. The i/d ratio merely excludes categories 4 and 5 and becomes categories 1 + 2 + 3 divided by 6 + 7. The need for two ratios is due to the fact that in some subject matter fields, such as mathematics, questions, category 4, are used differently than they are in other fields, such as social studies. This is also true of lecturing, category 5. The i/d ratio is a proportion of indirect to direct teacher influence that is affected less by the subject matter being taught. The I/D ratio is more inclusive because it makes use of all teacher statements.

Another concept about teacher influence can be obtained from an analysis of the five separate matrices that are used to tabulate interaction analysis data for the five types of classroom activity. The range or spread of I/D and i/d ratios for each of these five matrices is an estimate of what we call teacher flexibility of influence. A theoretical example is illustrated in Figure 1.1 on the next page.

The I/D ratio of Teacher A changes quite radically from one type of classroom activity to the next. Teacher B makes very little variation of I/D with the different class activities. Teacher A will have a higher over-all I/D ratio than will Teacher B even though at times A is more directive.

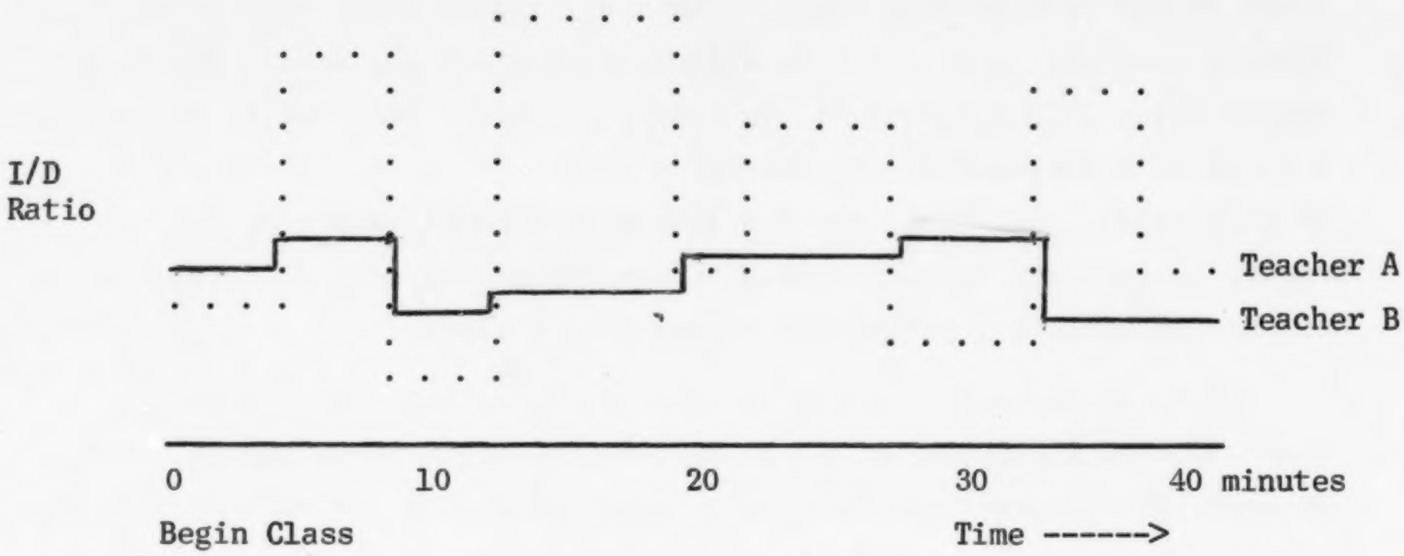

Figure 1.1

A Theoretical Model of a Flexible and Rigid Pattern of Teacher Influence

In both inservice training programs, emphasis was given to adapting teacher behavior to various classroom learning activities, to discussions of when direct and indirect patterns of influence are most appropriate, and to the fact that increased flexibility is usually associated with an increase in the I/D ratio. Merely becoming more indirect, or more direct for that matter, was never advocated as a goal in itself. Each teacher was urged to explore new patterns of teacher influence and to be his own judge as to which patterns were most effective.

Overview of the Project

In order to give a brief overview of the entire project and the sequence of steps taken, the following chronological outline is presented.

Steps Taken Prior to August, 1960.

The Hopkins School District was selected from among several volunteer districts because it had two junior high schools that were located within easy driving distance from the University. Other districts that volunteered agreed to provide observers for the project on the assumption that the observer training would be of value to the professional development of the person involved. Meetings were held with the Superintendent, central office administrators, and building principals to orient them to the project. The project plans were also presented to the School Board.

The following agreements were reached at these early meetings: (a) no data about any teacher would be available to any employee of the Hopkins School District; (b) a Research Steering Committee would be formed composed chiefly of classroom teachers; no procedure or test would be used before it had been reviewed by this committee and modified, if necessary, in order to obtain its endorsement; and (c) the School Board would contribute financially to the project by providing $75 or free tuition if credit was desired for every teacher who participated in the inservice training program.

Activities from September Through December, 1960.

First, during the fall observer training was carried out in three phases. Phase one consisted of 12 hours of training for all volunteers from eight surrounding school districts. Twenty-two participants attended these meetings. Phase two consisted of an additional six hours of training for 14 individuals (including project staff members) who agreed to act as observers during the months of October, November, December, March, April and May and whose earlier reliability scores indicated the promise of satisfactory performance. Phase three consisted of an additional six hours of training for four observers who had completed phases one and two, they were joined by members of the research staff in order to explore the gentle art of consulting with teachers. This third phase concentrated on interviewing skills necessary in feeding back information about teacher behavior to the individual who had been observed. Considerable attention was given to the interpretation of matrices. A full report of inter-observer reliability will be given later in this report.

Second, a Research Steering Committee was formed which consisted of the Director of Secondary Education, the two building principals, and four classroom teachers. The early meetings of this group accomplished the following: (a) plans for approaching the classroom teachers were presented, modified and finally approved after many helpful suggestions; (b) this Committee discussed and finally recommended an amount of compensation for teachers which was later slightly reduced by the Board; (c) it was agreed that no employee of the Hopkins School District would be used as a classroom observer, and the principle of keeping all data anonymous, particularly with regard to employees of Hopkins, was reaffirmed; (d) all tests and procedures were reviewed and approved; and (e) the Committee agreed to serve as a liason group between the research team and teachers in general.

Third, the following types of data were scheduled and collected: (a) each teacher participating in the inservice training, and each of those in the control, were observed by trained observers for approximately six hours each; (b) the Minnesota Teacher Attitude Inventory (MTAI) was administered to nearly all (only a few were absent) of the faculties in the two junior high schools and the senior high school in order to have one instrument with which to compare those who volunteered with those who did not; (c) the two forms of the Cattell Sixteen Factor Personality Inventory and the Runner Questionnaire were administered to all teachers who were to participate in the inservice training; and (d) during late October, the Minnesota Student Attitude Inventory (MSAI) was administered to more than 3,000 students in the classes of the teachers who were participating in the inservice training plus those who were in the control group.

The Inservice Training During January, February and Early March, 1961.

Two training groups were formed from the 51 teachers who were accepted as volunteers for inservice training, one group of 25 met on Saturday mornings, the other group of 26 met on Monday evenings. Thirteen teachers were assigned to the control group; later two had to be dropped due to incomplete observation. The assignment to the Monday and Saturday groups was through self-selection according to convenience. None of the teachers in the control group attended any of the inservice training sessions, but some additional teachers did who were unacceptable as trainees, such as band, physical education or shop instructors. Such instructors were excluded from the experimental groups because patterns of verbal communication in their classes would be radically different from the more academic subject fields.

The inservice training program was divided into three periods; (a) the introductory period of four weeks was used for presenting basic concepts and procedures; (b) the application period of three weeks was provided for self-experimentation and application on a voluntary basis; and (c) the final two weeks were used for evaluating the training program. During the introductory four weeks and the two weeks of evaluation each group met for four hours; Saturday 8:00 A.M. to 12:00 noon and Monday, 6:00 P.M. to 10:00 P.M. During the three-week application period each group met twice for two hour sessions. Thus, each group met for 28 hours of organized inservice training sessions. Additional time was spent by teachers as will be shown in the analysis of the data.

After each of the nine inservice training sessions Post Meeting Reaction Sheets (PMRS) were filled out by the teachers. This instrument provided us with information about voluntary activities outside of the general sessions as reported by teachers, with comparisons of the training to "other courses taken in education", and with the participants reactions to and expectations about each session along a number of dimensions.

During the three week application period a record was kept of all teachers who requested and received a visit from a staff observer-consultant. Records were also kept of teachers who formed teams in order to conduct their own observations and experiments.

Activities During March, April, and May, 1961.

Just before the end of the inservice training, a second administration of the MSAI was administered to the same 3,000 + students in the classes of the inservice participants and the control group. The third administration of this test occurred during the last half of April. These three administrations of the MSAI to the students of the participating teachers gave us information about the student's perceptions of the teachers' behavior.

During April, and part of May, the observation team met to brush up on their observation skills and then repeated the six hours of observation on all 51 teachers who participated in the inservice training as well as the teachers in the control group.

Summary

In this chapter we have attempted to summarize previous research on inservice training and to describe the setting of the present project. Our remarks have been rather brief in order to conserve space, much more could be said about the functions of the Steering Committee, the nature of the inservice training, and the many unusual and interesting events that arose in the course of the project.

In the next chapter we will present the rationale, hypotheses and procedures of the project in order to bring the research design into focus.

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Chapter Two

RATIONALE, HYPOTHESES, AND PROCEDURES

Comments About Teachers Changing Their Behavior

Our purpose was to come as close as we could to creating a school-wide atmosphere of professional inquiry in which the object of inquiry was the teacher's own behavior. Such an atmosphere is uncommon. Even in schools that are most active in professional improvement, the emphasis is on the intellectual aspects of curriculum revision such as learning new teaching methods, or taking additional courses for advanced degrees which provide the teacher with presumably new information.

The emphasis on the intellectual aspects, that is, on obtaining new information, is a natural extension of teacher education courses and all the earlier education to which teachers are exposed. Within the profession, as well as within our society, restraints against becoming involved with the emotional aspects of behavior are commonplace. Few individuals are prepared to handle emotionally toned compliments or criticism smoothly and skillfully. "Let's not become emotional about this!" is the cliché we often use to avoid dealing directly with attitudes or feelings, even though progress in solving an intellectual problem may have stopped.

Of course, this distinction between the intellectual and the emotional aspects of improving instruction is useful only in the initial stages of our thinking; what we are really discussing is the application of certain intellectual skills to the emotional aspects of inducing change.

In varying degrees, teachers have ability in semantics, scientific procedure, skill in deductive and inductive reasoning, and similar tools for thinking, yet few of us have applied them systematically to an analysis of overt behavior. The application of these intellectual skills to behavior involves the emotional aspects of social interaction, and requires sufficient modification so that it becomes useful to refer to certain "social skills" for dealing with feelings, just as we refer to intellectual skills for dealing with ideas.

Some of the social skills that seem essential to teaching are: (a) the ability to accept, clarify, and make constructive use of ideas and feelings expressed by pupils; (b) the ability to summarize in a discussion as a method of guiding inquiry; (c) the ability to predict, or at least speculate about, both the emotional as well as intellectual consequences of various alternatives when a decision is necessary; (d) the ability to ask questions about feelings and attitudes in such a way that purely defensive responses are avoided; (e) the ability to relate feelings and attitudes to intellectual tasks so that more realistic forces of motivation are created; (f) the ability to develop a sense of timing that is invloved in knowing when to digress from the intellectual aspects of a task in order to face negative feelings realistically or make fuller use of positive feelings; (g) the ability to ask broad or narrow questions and the insight to predict the consequences of using either; and similar patterns of teacher behavior which are rarely taught in teacher preparation or inservice training courses.

We anticipated difficulties in creating a schoolwide atmosphere that was free enough from threat so that personal inquiry could be carried out. We decided to begin with a filmstrip that dealt directly with the attitudes and feelings of teachers toward inservice training programs. The identification of these feelings and an analysis of their consequences became the first order of business. Second, we decided to teach the procedures of interaction analysis to all teachers so that they would have a tool for investigating their own behavior. Third, we decided to introduce new concepts associated with interaction analysis and avoid more commonly used concepts that are often distorted in meaning.

Fourth, we decided that the use of certain social skills by the inservice instructor would become a major difference in the two inservice training programs.

One final expectation was that even the most gifted teachers had not yet realized the full development of their social skills for dealing with the emotional aspects of classroom learning activities; in other words, there were higher levels of self-control, while teaching, toward which they could work successfully. To put it in quantitative terms, no teacher was near his ceiling with regard to increasing his i/d or I/D ratios.

It is appropriate here to make explicit the relationship between these ratios and the utilization of social skills in the classroom. Categories 1, 2, and 3 are verbal statements that are most directly related to many of the social skills listed earlier. As was illustrated in Figure 1.1, page 18, higher I/D or i/d ratios were not expected to occur by increasing the use of social skills in all phases of teaching, instead these ratios were expected to increase through appropriately timed, flexible adaptation of indirect and direct patterns of teacher influence. By becoming more indirect during those phases of classroom learning activities at which such an emphasis was appropriate, one result would be higher I/D and i/d ratios.

Incidently, the idea of increasing these ratios was NOT mentioned to the teachers in the early phases of the inservice training as an end in itself. Our hope was that if we provided the tools and the right conditions, teachers would discover these changes by themselves.

Hypotheses About Inservice Training

Our general approach to the design of the inservice training project can be stated as if it were an hypothesis, namely, the characteristics of interaction in any superior classroom will also be most effective when applied to inservice training. That is, the evidence on hand before we designed the inservice training programs indicated that when teachers at various grade levels used certain flexible patterns of teacher influence that resulted in higher average I/D ratios, then measures of constructive pupil attitudes were higher, and, in the case of our experiments with seventh grade social studies and eighth grade mathematics classes, content achievement was superior as well. From this we reasoned that if two different inservice training programs were created, one in which the instructor was more flexible and used more indirect influence, then teachers in the latter program would make more progress in terms of changing their classroom behavior.

Several considerations suggested that this general hypothesis be modified. Our concern grew out of the observation that the "pupils" in the inservice training were mature, adult teachers who had already developed (except for a few first year teachers) a teaching style of their own. Matters were further complicated because the subject matter of the inservice training was "teaching". Initial teaching style, which would be measured by observation in the fall before inservice training, should affect their perception of the inservice training activities and, in particular, their reactions to the behavior of the inservice training instructor. Furthermore, because of their differences in teaching style, their initial expectations about what constitutes good and bad inservice training may very well be quite different.

The Compatibility Hypotheses.

The foregoing considerations led to the development of what were soon called the compatibility hypotheses. These hypotheses are based on the assumption that we could create two different inservice training programs, one in which the instructor was more indirect -- the Saturday Group, and one in which the instructor was more direct -- the Monday Group. We also assumed that the fall observation data would permit us to divide teachers into so called "direct" and "indirect" styles of teaching, according to whether they were above or below the median for the entire sample of 62 teachers before the inservice training started.

Hypothesis A:--Teachers above the median on being indirect in their own classrooms will gain the most when exposed to an indirect program of inservice training.

Hypothesis B:--Teachers below the median on being indirect in their own classrooms will gain the most when exposed to a direct program of inservice training.

Hypothesis C:--Teachers below the median in their own classrooms who are exposed to an indirect inservice training program would show less gain than the above two groups.

Hypothesis D:--Teachers above the median in their own classrooms and who are exposed to a more direct inservice training program will show the least gain.

The phrases "gaining more" or "gaining less" in the above hypotheses refer to making those changes in overt behavior, the fall observations compared with the spring, such that there is an increase in the use of indirect patterns of teacher influence. Changes will be analyzed in terms of an increase or decrease in the I/D and i/d ratios. Additional inferences would be possible from an analysis of the 10 x 10 matrices involved, including an index of flexibility in teaching.

Additional Hypotheses.

Due to individual differences among the teachers both in personality and natural style of teaching, we would expect differences in the teachers' perceptions of the inservice training activities and their appraisal of the behavior of the inservice training instructor. Hypothesizing about these differences, prior to collecting the data, would have left us on pretty thin ice, especially in terms of an adequate theory. We had some hunches, particularly about teachers who were naturally more indirect. For example, one might easily guess that a naturally indirect teacher exposed to a directive inservice training program would become most dissatisfied. But one can think of several explanations about the teachers whose natural style of teaching is more direct which lead to opposite outcomes. Such explanations would hinge on (a) whether the more direct teachers would be as sensitive to the differences between the two types of inservice training programs, (b) whether they would more likely resist and resent pressures toward more flexible and indirect teaching in either or both programs, (c) whether they were genuinely satisfied with their present teaching styles, and a host of other considerations.

Faced with these complexities, we retreated to safer grounds. We reasoned that in any case, there ought to be relationships between the teachers' reactions to the inservice training and what he gained in terms of change in behavior. A person who is dissatisfied with the inservice training situation is less likely to mobilize the energy required to explore and experiment with his own behavior; a person who is more satisfied is more likely to make progress.

Hypothesis E:--Teachers who show the most gain in indirect teaching behavior will be the most satisfied with the inservice training program.

Perhaps this is the place to note that two of our staff members who were Ph.D. candidates collected data for their theses as part of this total project. They had a number of hypotheses that were concerned with personality data collected before the inservice training activities started. Davies (1) was interested in investigating relationships between various personality measures and the natural style of the teacher *as observed during the fall, before the inservice training took place.* Storlie (6) was interested in relationships between these same personality data and change in behavior as a result of participating in the inservice training programs. The hypotheses involved in these two adjunctive studies will not be listed here, but brief mention will be made of their results in Chapter Three of this report.

The Experimental Design

The original design was the classical comparison of two experimental groups and a control group with pre-and-post measures of the outcome variables. This design deteriorated so that the advantages of using an analysis of variance or covariance could not be realized for a number of reasons that will now be outlined.

Contamination of the Research Design.

First, it was not possible to assign teachers to the three groups at random which probably would have made the groups more equivalent initially and should have helped to control other factors that influence change in teacher behavior. The initial differences between the groups will be presented later in this chapter and the possible effects of these differences will be discussed.

Second, the control group did not provide a stable base line for the more important outcome variables against which measures of the two experimental groups could be compared. This turn of events came about because the control group was too small and because the complexity of adequate time sampling for interaction analysis was not anticipated properly. For example, the visits of the observers to control group classes, particularly in the spring, coincided with unusual or bizarre classroom activities which resulted in extremely divergent measures of teacher influence. A larger control group or more adequate control of what was observed would have helped. The net effect of this development was that only limited reference to the control group was possible.

Third, if each of the three groups of teachers in the original design had been in separate schools, communication between teachers about the inservice training would have been nonexistant for all practical purposes. Several arguments suggest that the communication among teachers that did exist cannot account for the conclusions that will be presented in the last chapter of this report. For example, it is true that only a majority of teachers were aware of the more indirect instructor behavior in the Saturday group. All of them should have been because it was announced at the opening session of both groups that[1] — "The Saturday group will be given greater opportunity to express their own opinions and take greater responsibility in directing their own activities. On the other hand, the Monday group will be given more information through lecture and more direct suggestions concerning inservice training activities. It is expected that certain types of teachers will be more satisfied with the Saturday methods and other types of teachers will be more satisfied with the Monday methods."

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[1] A tape recording was made of the introductory statements of the inservice training instructor in both groups. Tape recordings were also made of small group evaluation discussions on the last day of the inservice training. Quotations which will be presented in various parts of this research report were taken from such recordings.

It is an historical fact that general enthusiasm and self-initiative became gradually higher in the Saturday group, and some teachers, particularly those in the Monday group, expressed dissatisfaction with this turn of events during the evaluation discussions at the end of the inservice programs. As teachers became aware of these symptoms, they may have reenforced the different atmospheres that were expected to result from the two programs. Such effects were more noticeable during the last four weeks of the training programs.

Modifications in the Research Design.

The lack of a stable base line in the control group variables meant that experimental control had to be achieved by a more cumbersome and time consuming statistical analysis. Fortunately, teacher perceptions of the inservice training activities were collected once a week, these perceptions combined with original classifications of teachers from the fall observation data permitted specific comparisons within and between the Saturday and Monday groups that are relevant to our hypotheses.

Table 2.1 illustrates the types of comparisons that were made in the analysis of data. First, 25 teachers were enrolled in the Saturday group in which the instructor was more indirect and 26 teachers were enrolled in the Monday group in which the instructor was more direct; these two groups appear in column two of Table 2.1. Second, in each inservice program, teachers who were above or below the median of I/D based on observations before training, are shown in column three. The next two columns of Table 2.1 illustrate how teachers were classified according to their perceptions of the inservice training, whether they

Table 2.1

SCHEME OF CLASSIFYING TEACHERS FOR ANALYZING OUTCOME VARIABLES

Teachers	Program of Inservice Training	Classification of teachers by I/D or i/d from the Fall observations	Further Classification	
			Teacher's perception of Inservice Training	Satisfied or dissatisfied with the inservice training.
Control N = 6		Indirect, N = 5 Direct, N = 6		
Participating in the inservice training, N = 51	N = 25 Indirect (Saturday)	I/D, N = 10 Indirect	indirect direct	satisfied dissatisfied
		Direct I/D, N = 15	indirect direct	satisfied dissatisfied
	N = 26 Direct (Monday)	I/D, N = 16 Indirect	indirect direct	satisfied dissatisfied
		Direct	indirect direct	satisfied dissatisfied

perceived the instructor's behavior as direct or indirect and whether they were satisfied or dissatisfied with the inservice training.

By employing this system of classifying teachers who participated in the inservice training, it was possible to test the five hypotheses stated in earlier sections of this chapter. For example, we would expect the indirect teachers in the Saturday training, who perceived such training as indirect, and who were satisfied with the training to show the maximum gain in I/D or i/d, according to the compatibility hypotheses. Many other comparisons were possible according to the various combinations easily imagined from an inspection of Table 2.1.

By way of summary, the loss of the control group curtailed and limited any analyses that were concerned with whether participation in either type of inservice training program was really different compared with no training program at all. For instance, we cannot adequately answer a question about whether or not there are natural seasonal increases, Fall to Spring, in I/D or i/d which should be taken into consideration. On the other hand, all comparisons involving Saturday versus Monday methods of training including the compatibility hypotheses can be made without reference to a control group.

The Sample of Teachers in the Project

The Hopkins School District is located in a suburb of the metropolitan Minneapolis-St. Paul area and is quite typical of other suburban systems in terms of salary schedules, increasing student populations, building programs and the like. There were 150 full time secondary teachers in the high school and the two junior high schools. Sixty-two teachers volunteered either for the control group or to participate in the inservice training. The subject matter taught, sex and school of the 62 teachers is shown in Table 2.2, which is shown on the next page.

No particular pattern of subject matter specialization appears to distinguish one group from another. It is unlikely that subject matter specialization would account for any differences among the groups.

The MTAI, developed by Cook, Leeds and Callis in 1948, was administered to the entire sample and 91 of the remaining 99 secondary teachers in the school system. The results are shown in Table 2.3 and indicate that the teachers who volunteered scored higher than those who did not. This difference is barely significant at the 0.05 level of confidence. Higher scores on this test are associated with teachers who choose

Table 2.7

COMPOSITION OF GROUPS IN THE PROJECT

Subject Taught		Saturday	Monday	Control	Total
English		3	5	2	10
Social Studies		8	5	2	15
Mathematics		4	7	2	13
Science		5	5	3	13
Art		2	1	0	3
Reading		2	1	0	3
Speech		1	1	0	2
Language		0	1	1	2
Home Economics		0	0	1	1
Sex	Male	18	15	7	40
	Female	7	11	4	22
Schools	Jr. High #1	11	7	7	25
	Jr. High #2	7	14	1	22
	High School	7	5	3	15

answers indicating an understanding and acceptance of children, and generally more desirable attitudes as teachers.

Another comparison between our sample of participants in the in-service training and other secondary teachers who did not volunteer was made by Davies (1). She made use of the Douglass formula (2) which was adapted for use in the Evaluative Criteria of the Cooperative Research Study of Secondary School Standards (5). The formula equates various responsibilities of teachers in terms of "teaching load units". Further explanation can be found by referring to Davies' thesis, page 58.

Her comparison of the 51 participants with 53 nonparticipants, some were absent on the day data were collected, shows a mean of 27.05 for

Table 2.3

COMPARISON OF GROUPS BY M.T.A.I. SCORES

Group	N	Mean	Variance	
Saturday	25	142.32	741.64	a
Monday	26	141.58	848.91	
All Participants	51	141.94	812.66	b
Non Participants	91	132.00	827.26	
Total Teachers	142	135.57	822.00	

a. t = 0.39 which is not significant at 49 d.f.

b. t = 2.03; t = 1.98 for 0.05 at 120 d.f.

the 51 participants and 25.83 for 53 nonparticipants. This small difference was barely significant at the 0.05 level, which was possible due to the extremely low variance among all scores.

In further comparisons, Davies showed that the 51 teachers had all earned their bachelor's degree and 32 had additional credits; 22 had earned a master's degree. The participating teachers were also somewhat younger than the 150 secondary teachers.

To summarize, there were consistent trends when the 51 participating teachers were compared with the nonparticipants as shown by more positive attitudes on the MTAI, slightly higher teaching loads, slightly younger, and presumably a more active interest in earning higher academic degrees. These differences were so small that they barely reached the 0.05 level of significance, in two instances, and were not significant in others. A reasonable conclusion is that while differences between the 51 participants and the rest of the secondary faculty did exist, they were not dramatic differences. In view of the ambiguous relationship between these personal attributes and overt behavior while teaching, it seems reasonable to believe that the participants probably reacted to the inservice training in much the same fashion as others on the faculty would have. At least, there is no sharp evidence to the contrary.

Further Comparisons Between the Monday, Saturday and Control Groups

Additional comparisons between the Monday, Saturday, and Control Groups can be made in terms of personality data, interaction analysis data, flexibility of teacher influence data, and student scores on the MSAI, all of which were collected before the inservice training programs started.

Personality Data.

The pre-inservice training comparison of the groups in terms of personality data, proposed in the original design of the project, became somewhat academic -- not to mention useless -- because of Storlie's conclusion that there were no significant relationships between personality characteristics of teachers and their tendency to increase or decrease their use of indirect influence as a result of inservice training. His thesis included both analysis of variance and covariance and the analyses were repeated by reversing the predictor variables in order to avoid distortion by the non-normality of the interaction analysis data. As an additional check, a Chi-square test was made for an above and below the median split, Saturday versus Monday, on eight of the I.P.A.T. - 16 P-F personality scales, developed by Cattell, Saunders, and Stice[1]. No significant differences were noted. (See Table A.1, Appendix A)

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[1] Published by the Institute for Personality and Ability Testing, Champaign, Illinois. Forms A and B, 1956-57 Edition.

Interaction Analysis Data From Fall Classroom Observation.

All three groups were observed in the fall and I/D and i/d ratios were computed for each of the teachers for their combined matrices as well as for each of the time-use activity periods. Because these ratios are not normally distributed a Chi-square median split test of significance was calculated between groups. There were no significant differences between the Saturday, Monday and Control groups based on classroom observation before inservice training. (See Table A.2, Appendix A)

A flexibility index, as explained on page 17, Chapter One, is a number obtained by subtracting the highest from the lowest I/D ratio where each ratio is based on a composite matrix for each of the five time-use activity categories. Comparisons of the flexibility indices for the Monday, Saturday, and Control groups revealed that the Monday group was significantly higher than the Saturday group. Apparently the teachers in the Monday program made larger adjustments in their pattern of influence, one type of classroom activity compared with another. A Chi-square test was used instead of a t-test because of non-normal data. Table 2.4 shows the results.

Student Perceptions of Teacher Behavior.

The MSAI test was administered in the Fall to one morning and one afternoon class of each teacher in the three groups. Unfortunately an F-test showed a significantly large difference in the variances of the groups so that we again resorted to a median split Chi-square test to analyze the differences among the groups. No significant differences were found on student attitudes before inservice training, one group compared with another. (See Table A.3, Appendix A)

Summary of Comparisons Before Inservice Training.

Comparisons were made between the Saturday, Monday and Control groups on seven variables by the procedure of identifying the median for all 62 teachers in these three groups and then testing the split

Table 2.4

FLEXIBILITY BASED ON FALL OBSERVATIONS

Group	Statistic	Flexibility Index	
Saturday	Mean	0.288	
	Median	0.151	
	N	24[a]	b
Monday	Mean	0.542	
	Median	0.516	c
	N	26	d
Control	Mean	0.646	
	Median	0.407	
	N	11	

a. One teacher dropped because of too little data in some time-use categories

b. $X^2 = 7.02$, significant beyond 0.01

c. $X^2 = 2.08$, not significant

d. $X^2 = 0.8$, not significant

on those above and below the median for each group. With regard to teacher attitudes and response to personality scales there were no significant differences; with regard to the students' perception of the teacher, analyzed separately for the morning and afternoon classes, there were no significant differences; finally, interaction analysis data from classroom observations showed no significant differences between groups for I/D and i/d ratios, but a significant difference between the Monday and Saturday groups was observed on initial flexibility. The Monday group had the higher proportion of flexible teachers. This initial difference must be kept in mind in any comparisons made in subsequent sections of this report.

Taken altogether, these analyses suggest that initially there were no striking differences among the three groups. Those of us on the project staff are disposed to remain skeptical. The test of significance was a weak choice forced upon us by the non-normal distributions of the data. A summarization of the seven splits is shown in Table 2.5. Trends among the paper-and-pencil tests are clearly nonsignificant, but our measures of verbal behavior from classroom observation show consistent nearly significant or significant trends. The Monday group was more indirect and significantly more flexible.

Table 2.5

SUMMARY OF COMPARISONS BETWEEN GROUPS
BEFORE INSERVICE TRAINING

Group	Split	Fall I/D	Fall i/d	Fall Flex. Index	Fall MSAI AM	Fall MSAI PM	16 P.F.	MTAI
Sat.	Above Mdn	10	11	7	12	11	11	12
	Below Mdn	15	14	17 [a]	13	12	13	12
Mon.	Above Mdn	16	16	18	12	11	14	13
	Below Mdn	10	10	8	14	13	12	13
Control	Above Mdn	5	4	6	7	7	b	b
	Below Mdn	6	7	5	4	3	b	b

a. Significant differences found

b. No data for these 11 teachers

Fortunately, these differences are in a direction which makes a test of the compatibility hypotheses more rigorous. The more flexible, indirect teachers are present in a higher proportion in the Monday group. This is the group which was exposed to the more direct methods of inservice training. We would expect that it would be more difficult to help less flexible, more direct Saturday teachers change their patterns of overt influence compared with the Monday group. The initial bias, such as it is, could be expected to work against the predictions hypothesized in the compatibility hypotheses.

Reliability of the Data Collecting Procedures

Problems of reliability in any data collecting technique are concerned primarily with estimating error of measurement. The fact remains, however, that in most instances, reliability coefficients are merely reported and readers are left to make their own interpretations. We claim no special skills in finding an intelligible, straight-forward attack on these extremely complex problems. What follows is the best we can offer at this stage of our research.

Reliability of Observers Using Classroom, Interaction Analysis.[1]

Reference has already been made, page 19, Chapter One, to three phases through which observer training activities passed. In this section the program will be explained in greater detail including retraining in the Spring just before the post-inservice operations.

Phase One:--Twenty-two volunteers from Hennepin County school districts took part in the fifteen hours of formal training involved in phase one. The group consisted mainly of principals, supervisors, and central office personnel from the cooperating districts. Training activities consisted of discussing the categories, practicing with tape recordings, introduction to tabulating procedures and matrix analysis. At several points during this training trial reliability checks were made.

The reliability coefficient used is called the Scott Index. The method of calculation is explained in detail by Flanders (3, p. 39). In essence a ratio is set up in which the percent agreement between two observers less what might be expected by chance is divided by perfect agreement less what might be expected by chance. The formula used is as follows:

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[1] Special thanks is extended to Richard Dawson whose report on observer reliability set a high standard within our graduate student staff.

$$\text{Scott Index} = \frac{P_o - P_e}{100 - P_e}, \text{ in which}$$

P_o is the per cent agreement calculated by subtracting the per cent error between two observers from 100. P_e is found by squaring the percentage of tallies falling into each category, dividing each product by 100, and then summing over all categories. The Scott Index has the advantage that adjustments are made for the number and extent to which each category is used. Thus, P_e becomes larger if a high proportion of tallies fall into just one or two categories, requiring, in turn, a higher P_o for the same index level of reliability.

The Scott Indices for the first phase of training are shown in Figure 2.1 for 21 individuals whose observations were being compared with a master distribution of a tape recording worked out ahead of time.

Phase Two:--This phase contained most of the activities that were included in phase one, but greater emphasis was placed on live classroom observation with a fellow observer. There were also many practice observations made alone by each observer in his own school system.

Scott indices for the fourteen observers who participated in this phase of the training are shown in Table 2.6. Improvement is clearly evident.

Discussion of phase three will be postponed a moment, in order to follow the 14 observers of phase two into the fall and spring observations. Reliability checks during the rather complicated scheduling of 14 observers assigned to visit 63 teachers were carried out by a single staff member who became a "roving reliability check". While the 14 were busy with their assignments, the roving staff member arranged to make 28 joint observations from November 3rd to December 2nd. Thus, the reliability indices shown in Table 2.7 are representative of the level of observation during the fall classroom visits.

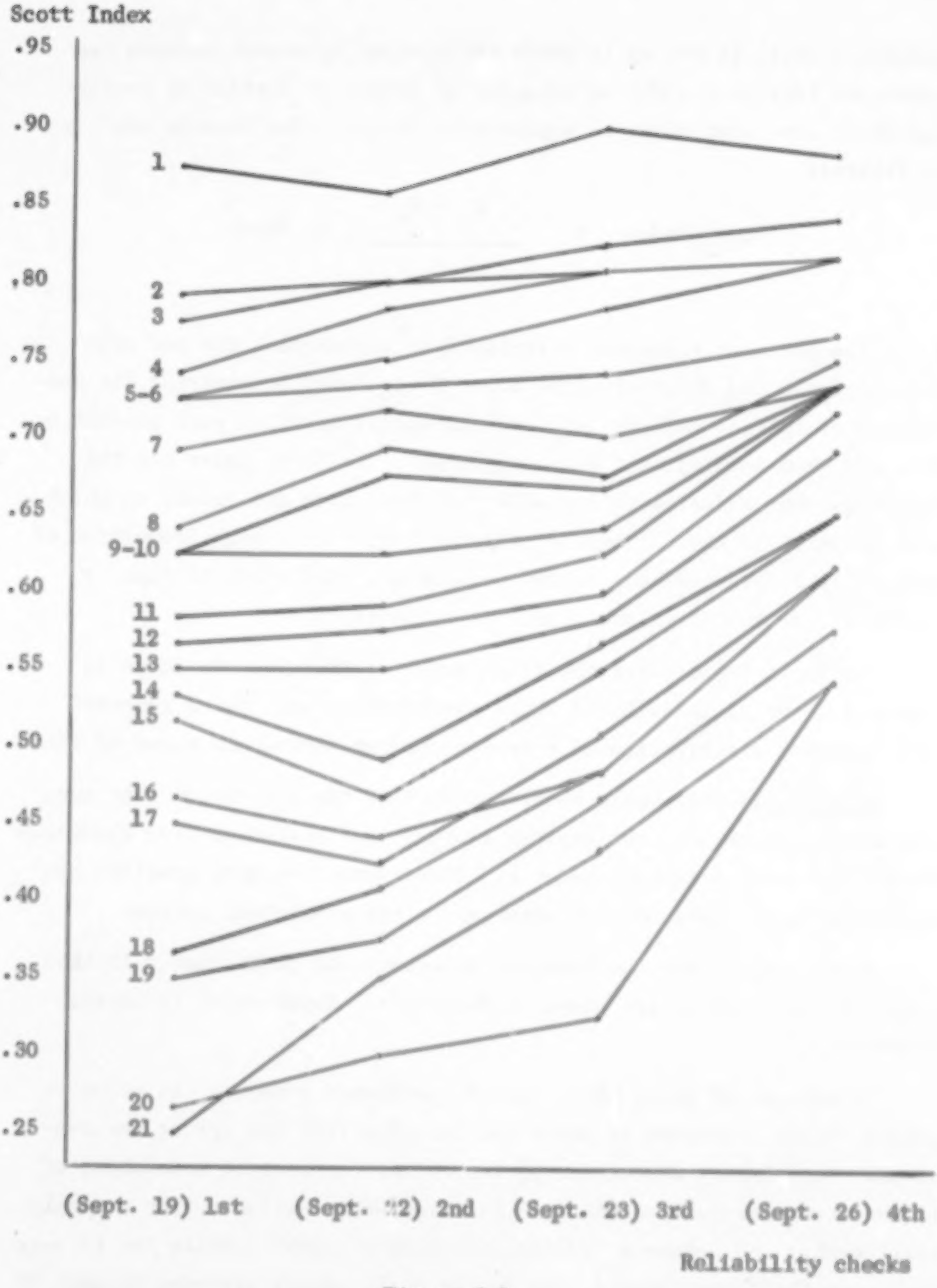

Figure 2.1

Phase One Training Reliability Coefficients

Table 2.6

LEVEL TWO TRAINING IN CLASSROOMS

Observers in Classroom Training	Time Check		
	4th Oct.	11th Oct.	25th Oct.
1.	.83	.84	.84
2.	.79	.80	.93
3.	.79	.78	.86
4.	.86	.88	.85
5.	.78	.81	.91
6.	.77	.83	.85
7.	.80	.87	.85
8.	.76	.85	.84
9.	.65	.84	.83
10.*	.48/.73	.83	.91
11.	.78	.78	.89
12.	.80	.83	.84
13.	.79	.76	.88
14.	.66	.81	.86

*Observer 10 was given an extra observation with the staff observer.

In the spring, the same 14 observers were given eight hours of refresher training after their 3 1/2 months of inactivity. The need for this additional training is illustrated by the first three columns of Table 2.8. During the eight hours of training three reliability checks were made, each showing some improvement. The right hand column of Table 2.8 shows the indices of 14 joint observations made in the field, using the same observers. The training and field checks were scheduled between April 6th and May 16th. A second series of field observation checks, as occurred in the fall, proved impossible to schedule, although

Table 2.7

FALL OBSERVER RELIABILITY IN THE FIELD
WITH ROVING STANDARD

Observers in Classroom Training	1st Observation	2nd Observation
1	.86	.87
2	.83	.85
3	.81	.97
4	.94	.86
5	.78	.85
6	.82	.91
7	.79	.90
8	.83	.88
9	.81	.87
10	.90	.87
11	.88	.83
12	.98	.86
13	.82	.83
14	.85	.84

the higher indices suggest that the spring observations may have been the most consistent.

Phase Three:--This phase was concerned with teacher-observer consultation and, as such, was not directly related to the control of the experiment. The object of this training was to practice social skills important in handling conferences with teachers that were requested during the work period of the inservice training program. Reliability of observation during these classroom visits was less important than the discussions that took place with the participating teachers. In fact, when a

Table 2.8

OBSERVER RELIABILITY IN SPRING REFRESHER TRAINING AND FIELD OBSERVATIONS

Observers in Classroom Training	Refresher Training Checks			Second Section Field Check
1	.40	.45	.78	.87
2	.63	.58	.77	.87
3	.73	.90	.79	.85
4	.62	.79	.79	.91
5	.74	b	.75	.85
6	.75	.90	.88	.81
7	.62	.63	.91	.93
8[a]	.39	.40/.51	.95	.95
9[a]	.62	b /.57	.88	.86
10	.60	.83	.79	.90
11	.62	.70	.88	.90
12	b	.71	.76	.86
13	b	.64	.76	.85
14	.70	.74	.75	.86

a Observers 8 and 9 were given an extra training session with the staff observer.

b Observers were absent.

teacher disagrees with a consultant-observer regarding what kinds of statements should be classified in what categories, it is possible that less reliable observing may stimulate more constructive consultation. This last statement is purely conjecture, but can be supported by a rationale based on creating a situation in which the teacher becomes less dependent on the "expert" consultant. When a teacher argues about possible incorrect classifications and wins his point, the net effect is to analyze teacher behavior in a fashion that reduces the "expert status" of the consultant.

Estimating Error of Fall-Spring Observations:--An estimate of error is involved first in the effect of such error on the I/D and i/d ratios, and, second, on the interpretation of matrices. Knowing more about the effects of observation error is a research project in its own right. What is to be presented here must remain inconclusive, but will at least introduce the reader to some of the first-order difficulties.

There are some general statements about errors which form a backdrop to this discussion. First, the percent of error between two observers for a single category is inversely related to the total tallies in that category. The more frequently a particular type of event occurs, the smaller the proportional error. Thus, an unusual style of teaching broadly distributed among the ten categories increases error. Second, there is a different percentage error for each of the ten categories and each varies from one classroom visit to another. Some situations, including the nature of the classroom activities and the verbal role of the teacher, are simply more difficult to observe and, consequently, error is increased. Third, the context of an event, that is, what preceeds or follows it, provides the observer with important clues which affect error. When these clues are ambiguous, error increases. We might also note that each of the 100 cells in a 10 x 10 matrix has a different average error.

There are many types of errors. For example: (a) observers are not recording the same event even though they record accurately; (b) observers see the same event but classify it differently; (c) one observer is momentarily interrupted; (d) a rare event is completely missed by one observer; (e) an observer records an event which did not occur; and so it goes.

In the event that the reader has, by now, given up all hope that anything constructive can come of interaction analysis, we would like to point out that the meticulous analysis of error in nearly all tests currently used in research in the social sciences, with the possible exception of such scaling techniques as those advocated by Guttmann, would probably present a similar picture. Suppose one were to co-ordinate a single classification of an event by an observer to a single response made by a subject on a test. Very little evidence has been presented in the social science literature which shows individual errors in relation to reliability coefficients calculated by a variety of methods.

In a test administered by the principle investigator to approximately 1,200 pupils in New Zealand, four items, buried among a total of 67, were included because it was reasonable to assume that all respondents would give identical answers. Those marking incorrect or unexpected responses, regardless of the reason, varied between 72 pupils on one item to 153 on the item with the highest error. One might conclude that a good rule of thumb would be to disregard any differences smaller than 100 to 130 regardless of reliability coefficients which were reasonably high, say + 0.65 to + 0.78, for scales made up of 12 to 15 items. In this project, class averages were used to identify particular types of classrooms; used in this manner the validity of the test cannot be questioned.

Table 2.9 illustrates several relationships between error and the calculation of I/D and i/d ratios. Each row shows I/D and i/d ratios calculated from the records of observers. Row (a) is a short observation lasting some 15 minutes, in which the difference in the two I/D ratios is greater than 0.1 and no i/d ratios could be calculated. Rows (c) and (d) illustrate the different ratios calculated for relatively high Scott Indices: row (d) for a very indirect teacher, row (c) for a very direct teacher. An examination of all the I/D ratios shows the relationship of number of tallies to the reliability of the ratio: more tallies, less error.

In discussing the i/d ratios, it should be noted that when there are a few number of tallies in the indirect columns, the ratio is more apt to be less reliable. The tallies can be less for two reasons: either there are only a few tallies taken over all [see row (a)], or the emphasis of the teacher is on content, so that even though there are many tallies, only rarely do they fall out of the content cross. For example, the relatively large difference in the two i/d ratios in row (b) is partly explained by the fact that only nine per cent of all tallies occurred in

Table 2.9

ERROR IN I/D AND i/d RATIOS AT DIFFERENT
SCOTT RELIABILITY COEFFICIENTS

Row	Scott Index	Observer A		Observer B		Total Tallies[b]
		I/D	i/d	I/D	i/d	
(a)	0.83	0.870	a	0.670	a	300
(b)	0.88	0.197	1.490	0.210	1.380	1,212
(c)	0.96	0.182	0.105	0.184	0.112	2,246
(d)	0.96	0.362	5.040	0.391	5.550	1,116

a. No data in categories 6 and 7 for either observer.

b. Average for both observers

the combined categories 1, 2, 3, 6, and 7 so that just a few errors have a greater effect. In this same set of observations 816 tallies out of the 1,212 were in category 5 which increases P_e substantially, making it more difficult to maintain a high Scott Index.

These comments about error only stress the need for a careful investigation of how errors affect particular comparisons between any two observers. As interaction analysis is used more extensively, this topic will need additional, more careful study.

In spite of the foregoing complexities, it can be stated with conviction that error of observation cannot account for the conclusions to be presented in the last chapter of this report. First, extensive training helped to eliminate a consistent bias on the part of an observer and makes it more reasonable to assume that most errors were distributed in a random fashion. Second, each of the 14 observers was assigned to both Saturday and Monday teachers, five of the 14 observers also had control teachers on their schedule. Third, our conclusions were based on different clusters of teachers so that even if systematic bias did exist, which is less likely with adequate training, the effect of such bias would not affect comparisons between groups of teachers. Fourth, it was shown in Table 2.9 that when Scott Index coefficients are above 0.85 that errors in I/D or i/d ratios are relatively small; the error effects would be even smaller when groups of teachers are being compared. Finally, tests of significance take into account the variance of scores based on observation data. A great many errors by different observers would increase the variance of scores based on observation data to the point at which possible differences between groups would always be non-significant.

The Reliability of the Paper-and-Pencil Instruments.

The reliability coefficients of the various paper-and-pencil tests compare reasonably well with similar attitude inventories reported in the literature. Nonetheless, standard practices in reporting reliability often are inadequate as the evidence about to be presented indicates.

The Minnesota Student Attitude Inventory:--The MSAI was administered in the Fall, Winter and Spring to one morning and one afternoon class taught by each of the 62 teachers.

A Hoyt-Stunkard determination of reliability was calculated for a sample of single class administrations and found to vary considerably from one administration to the next. In another study, using a similar form of the same instrument the lowest variance obtained for a single class was 275.4 and the largest variance was 2,182.9, while the lowest class mean was 196 and the highest was 273. Apparently when students are asked questions about their attitudes toward the teacher and the schoolwork, we can expect wide variability of response, given a large number of classes.

The standard error of a single score becomes meaningless in this study because no use is made of the score of a single student. The standard error of the class mean, in a test of this sort, can vary from as low as 3.64 to as high as 8.85, depending on the particular administration. When a product-moment correlation was calculated for the class means from the Fall and Spring administrations, r = + 0.85 for 62 morning classes, and r = + 0.86 for the afternoon classes. These correlations indicate that in spite of rather large seasonal fall to spring decreases in class means, classes maintained a relatively stable position in the distributions of class averages.

Consider, however, the following correlations which tend to complicate this picture. In the Monday group, (N = 26), correlations for the same teacher's morning and afternoon classes were as follows: in the fall, r = + 0.49; and in the spring, r = + 0.71. The same correlations for the Saturday group, (N = 25), were as follows: in the fall, r = + 0.67; and in the spring, r = + 0.75. Later it will be reported that there were two general trends in the MSAI data: first, morning classes scored higher than afternoon classes in spite of being exposed to the same teacher; and second, class averages are much lower in the winter and spring administrations, compared with the fall.

These data raise more questions about reliability than they answer. Fall to spring test-retest reliability is quite high, but in certain individual classrooms reliability can be shown to be quite low. It may be that the test is unreliable for particular types of teachers or particular subject matter fields. The present research design was not prepared to provide answers to these questions.

Since no significant conclusions will be made which take into account MSAI scores, this discussion on MSAI reliability is included primarily as an interesting sidelight of the study.

The Post Meeting Reaction Sheet Scales.

The same PMRS was administered in both the Monday and Saturday groups at the end of each inservice training session. A sample copy is shown in Appendix C of this report. Scores on various single items and clusters of items combined as scales were used to classify teachers into special groups in order to compare certain variables. For example, a four item cluster was scored as a scale in order to measure the extent to which teachers perceived inservice training to be more or less directive. Two items were used to assess the teachers' judgement of how the inservice training activities compared with "other education courses you have taken".

In those cases in which several items were scored as a single scale, an intercorrelation matrix was calculated to justify combining the items. The most important cluster was the combination of items 2A, 5A, 7A, and 9A. The intercorrelations of these four items at the fourth meeting of the course are shown below in Table 2.10.

Table 2.10

INTERCORRELATIONS OF PMRS ITEMS 2A, 5A, 7A, and 9A

Item	2A	5A	7A	9A
2A	--	.79	.56	.53
5A		--	.60	.53
7A			--	.69
9A				--

The Hoyt-Stunkard Reliability Coefficient (4) for the entire four item scale varied considerably from one administration to the next. For example, in the Monday group, the scale reliability on the third administration was + 0.47, for the seventh was + 0.87, and for two combined but different administrations, it was + 0.64. The same three coefficients in the Saturday group were, respectively, + 0.75, + 0.46 and + 0.75.

For the two items which compared the inservice training to other education courses, an intercorrelation of + 0.81 was obtained for all 51 teachers. Yet the same two items calculated over three administrations for the Monday group was + 0.64 and for the Saturday group was + 0.71.

Additional intercorrelations and single administration reliability coefficients were calculated, but reporting them here would only add to the confusion. The only position our research staff could take, in view of the data, was that statistical tests of significance would take into account variability of scores and that the coefficients were not particularly helpful except as explanations of nonsignificant results. Let us simply say that the reliability of the scales and items used was reasonably high, certainly larger than chance, zero-order correlations.

This entire discussion raises an issue which, to our knowledge, has not been widely discussed in the literature, if it has been discussed at all, namely: of what value is a reliability coefficient and the standard error of a single score when all comparisons in the study make use only of group means?

Summary of the Chapter

We began this chapter with a discussion of teachers inquiring into the nature of their own overt behavior and an outline of some of the social skills considered essential to teaching. The content of the inservice training was closely related to the use of social skills while teaching.

A series of hypotheses relating the natural style of a teacher to expected change in classroom behavior were set forth which were consistent with previous research on the influence patterns of teachers. The present project consists of a test of these hypotheses to see if different types of inservice training will be more effective for teachers who have different natural styles.

The sample of teachers who participated in the inservice training was described and found to be somewhat different compared with other teachers in the same school system who chose not to participate. These differences were not likely to be different from other teachers in similar school systems.

Finally, considerable space was devoted to a discussion of the reliability of classroom observation and of the various paper-and-pencil tests used in the study. It was shown that the evidence on reliability was generally acceptable, but that measures were also variable, one situation compared with another. These variations, however, could not reasonably account for significant results, to be discussed in later chapters.

In the next chapter, the differences between the Monday and Saturday inservice training programs will be explained in greater detail. The question to be answered concerns whether or not two different inservice training conditions did in fact exist.

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Chapter Three

DIFFERENCES BETWEEN THE MONDAY AND SATURDAY INSERVICE TRAINING PROGRAMS

Differences Required by the Experimental Design

Both of the preceding chapters have made clear our intention to create a more indirect and flexible pattern of instruction in the Saturday group and a less flexible and more direct pattern of instruction in the Monday group. This chapter will be devoted to presenting evidence that these intentions were successfully carried out. Proof must be established that two different training programs did, in fact, exist and that the differences were consistent with the requirements of the experimental design.

The evidence will be presented by considering, first, data based on the participating teachers. Second, similarities in the use of time will be presented. Third, evidence from certain items on the PMRS will be presented to show that the participating teachers were aware of the differences in the behavior of the instructor. Finally, some illustrations will be presented from the tape recordings made at the end of the inservice training, not as objective evidence, but simply to give the reader an appreciation of the subjective reactions of some of the teachers.

Differences Between Saturday and Monday Sessions Based on Interaction Analysis

A trained observer of above average reliability (see Chapter Two, pages 42 to 48) was assigned to collect data at the first, second, fourth, and seventh meetings of the two groups. The sessions chosen for observation represent a sample of four out of a total of six sessions that took place during the first seven weeks. The same observer made all observations so that any unique bias he might have possessed would apply equally to both groups.

Table 3.1

INTERACTION MATRIX FOR THE SATURDAY GROUP

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0.7	---	---	---	1.8	---	---	---	0.2	0.2	2.8
2	---	1.8	1.9	2.1	2.5	0.2	---	---	16.4	1.2	26.2
3	---	0.5	34.5	1.9	3.2	0.5	---	0.4	2.3	1.2	44.5
4	0.2	1.2	0.4	11.1	5.7	0.7	0.2	12.4	12.4	5.5	49.7
5	1.4	9.9	4.2	18.0	485.9	3.7	1.6	0.9	10.4	5.5	541.5
6	---	---	0.2	1.4	2.7	3.2	---	1.1	2.5	2.5	13.4
7	---	---	---	0.5	1.1	0.4	1.2	---	---	---	3.2
8	---	---	0.9	2.1	4.6	0.9	0.2	8.1	8.3	0.2	25.3
9	0.4	11.7	2.1	9.0	26.0	2.1	---	1.2	193.0	10.1	255.6
10	0.2	1.1	0.4	3.4	8.3	1.8	---	1.2	10.1	11.5	37.8
Total	2.8	26.2	44.5	49.7	541.5	13.4	3.2	25.3	255.6	37.8	1,000.0

A composite matrix for each group is presented in Tables 3.1 and 3.2. These matrices are cumulative, that is, data collected at the four observations were tabulated into a single matrix. During the Saturday sessions observed 5,658 tallies were made; for Monday the total was 6,682. In other words, out of fourteen hours of meetings, about one-third of the time was spent in verbal communication between instructor and teachers in the Saturday group and about 40 per cent in the Monday group. The balance of time was used for many different activities including coffee breaks, small

Table 3.2

INTERACTION MATRIX FOR THE MONDAY GROUP

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0.6	---	---	---	1.5	---	0.2	---	0.2	0.2	2.5
2	---	---	0.5	0.8	0.9	---	---	0.2	9.9	0.2	12.3
3	---	0.3	8.4	1.2	1.2	---	---	---	1.8	0.3	13.2
4	---	---	---	7.5	3.7	0.5	0.2	9.6	5.2	5.8	32.5
5	2.0	6.6	1.4	13.5	694.7	3.4	2.1	0.6	14.2	5.5	744.0
6	---	0.3	---	---	2.1	3.4	---	---	1.8	1.7	9.3
7	---	---	---	0.2	2.2	0.2	2.5	---	1.1	0.2	6.3
8	---	0.3	0.5	2.0	4.9	---	0.2	2.4	3.4	0.3	13.9
9	---	4.5	2.5	4.3	25.1	0.9	1.2	---	96.8	1.8	137.2
10	---	0.3	---	3.1	7.5	0.9	---	1.2	2.8	13.0	28.9
Total	2.5	12.3	13.2	32.5	744.0	9.3	6.3	13.9	137.2	28.9	1,000.0

group discussions, viewing filmstrips, periods of training, and similar activities which did not involve formal communication with the instructor. The composite, raw data matrices were converted to the common base of 1,000 tallies so that direct comparisons between cells can be made more easily. The original matrices can be found in Appendix A.

The column totals indicate that talking time was divided between the instructor and the teachers in the following fashion, Monday versus Saturday respectively: for instructor talk 82 per cent versus 68 per cent; for teacher talk, 15 per cent versus 28 per cent; and silence or confusion, 3 per cent versus 4 per cent. The major feature of these comparisons is that when talking was appropriate, about 14 per cent more time was used by the instructor in the Monday sessions primarily for lecture, but in the Saturday sessions this same amount of time became available for teacher talk.

By way of clarification the word "instructor" refers to the man in charge of the inservice training who is acting in a teacher's role; the word "teacher" refers to the inservice trainees who are teachers acting in the role of students. In later chapters the word "teacher" will refer to the teacher in charge of a class and the words "students" or "pupils" will refer to the junior high school pupils.

When the instructor was talking, there were qualitative differences of influence between the Saturday and Monday groups. The I/D ratios were as follows: Saturday, 0.22; and for Monday, 0.08. The i/d ratios were as follows: Saturday, 4.43; and Monday, 1.79.

These broad descriptive differences can be summarized by saying that the instructor was seen by the observer as more indirect during the Saturday sessions, compared with the Monday sessions. By way of a base line, however, even the Monday group generated more teacher talk than normally occurs in an average college classroom. Instructor talk at the university level typically exceeds 90 per cent.

More subtle differences in the role of the instructor come into focus by comparing various cells in the two matrices. For example, a comparison of the 5-5 cell shows approximately 20 per cent less sustained, uninterrupted lecturing on the part of the instructor for the Saturday group. In turn, sustained talk by teachers, shown in the 8-8 and 9-9 cells, is twice as great in the Saturday group. One reason for this is that more questions were asked by the instructor in the Saturday group, see column 4 totals.

Turning to the social skills which are most clearly represented in columns and rows 1, 2 and 3, higher frequencies in these categories are evident in the Saturday sessions. It is interesting to note that the immediate clarification of teacher ideas by the instructor is exactly the same in both groups, see rows 8 and 9, column 3, yet the extended development of teacher ideas by the instructor (compare the 3-3 cells) occurred four times more frequently in the Saturday sessions, this ratio approaches a five to one ratio when teacher talk alone is considered.

One interesting comparison makes use of Storlie's "Teacher Influence Index" which consists of adding all tallies in columns 1, 2 and 3 in rows 1, 2, 3, 8 and 9 (2). This comparison, adjusted for total teacher talk, shows 3.65 more statements of this type in the Saturday group. Acts in the TII cells were shown in a previous study to be closely correlated with pupil attitudes in high school classes.

The more indirect influence purposely created in the Saturday group led to more ideas initiated by teachers as shown in categories eight and nine. The Saturday teachers initiated more ideas of their own, category nine, and the instructor was able to praise and encourage these more independent ideas more often, compare the 9-2 cells.

Before turning to the reactions of the teachers to these role differences, let us consider some of the similarities between the two matrices.

A rather unusual product of the teaching style of the instructor can be noted by inspecting columns 8 and 9, rows one to four. It is not often that the 2-9 cell exceeds the 4-8 cell in absolute frequencies of events. Tallies in the 4-8 cell occur when the instructor asks a question which is answered by a teacher. Tallies in the 2-9 cell, on the other hand, occur when a teacher is encouraged to express or continue expressing ideas which he initiated. The higher frequency in the 2-9 cell is apparent in both matrices, although somewhat more marked in the Saturday group.

The percentage of all tallies falling into the steady state cells that lie along the diagonal from cell 1-1 to 10-10 is not very different in the two matrices, once adjustments for instructor lecturing, the 5-5 cell, are taken into consideration.

One might also note that the total incidence of attention to feeling, column one, and criticism, column seven, by the instructor, accounts for less than one per cent of all talk. Comments of either type are less frequent in adult groups.

These two matrices are significantly different, beyond the 0.001 level of confidence by a Darwin Chi-square test of significance (1). It is reasonable to conclude, from these data, that the instructor was more indirect in the Saturday inservice training program.

Similarities in the Use of Time

While it is true that the instructor was more indirect in the Saturday group, the use of time during the first four sessions was approximately equal in both groups.

Table 3.3

USE OF TIME DURING FIRST FOUR INSERVICE SESSIONS IN PER CENT*

Group	No Interaction Data Collected			Observer Collects Interaction Data			
	Audio-Visual	Group Work	Breaks, Misc.	Routine	Evaluation	Lecture	Discussion
Monday	12.8	34.9	12.3	3.8	4.6	26.2	6.4
Saturday	15.6	37.3	14.1	4.1	3.8	17.0	8.1

* All figures rounded off to equal 100%; total of 16 hours involved representing the first four weeks.

A complete history of how time was used was kept by a second observer during all of the eight regular meetings during the nine week program. Table 3.3 indicates how time was used during the first four meetings which accounted for 16 of the 28 hours of formal sessions. During the first three types of activity, no interaction analysis data were collected. These were: (a) listening to tape recordings or filmstrips; (b) various types of decentralized group work including discussions, tabulating matrices, and practicing observing; and (c) coffee breaks, starting late or dismissing early. An observer was classifying communication during the other activities listed, (during three of the four sessions) including: routine announcements or making arrangements; administering or discussing evaluation instruments; and periods of lecture and/or discussion.

It can be seen by inspection of Table 3.3 that there are no striking differences in the use of time except in the last two columns, lecture and discussion. These differences are inevitable consequences of being more direct or indirect.

In the Monday group lecture was used more often to explore and explain different patterns of teacher behavior and to speculate on the consequences of such behavior. In the Saturday group, discussion by the teachers was stimulated by the more frequent use of questions and by making fuller use of ideas suggested by teachers.

Differences in the Perceptions of the Teachers

The major source of information about the reactions of the teachers to the inservice training was the Post Meeting Reaction Sheets referred to in terms of reliability, on pages 52-54 of Chapter Two. At the end of each session, teachers filled out a PMRS which can be scored to give two kinds of information. One procedure provides a difference score between what teachers wanted and what they saw, which indicated their satisfaction or dissatisfaction with the activities just completed: this measure is considered to be an outcome variable and will be discussed in the next chapter. A second scoring procedure was concerned only with teachers' perceptions of what happened, how they perceived what actually did occur: data from this second scoring system will now be presented and analyzed to show the differences in the reactions of teachers to the Saturday and Monday training programs.

Some Statistical Problems With PMRS Data.

The most efficient analysis of the perception data would have been an analysis of variance showing not only differences between the Monday and Saturday groups, but how these differences developed between successive meetings.

Such an analysis was started, but lack of homogeneity of variance forced the selection of a different statistical procedure. Figure 3.1 illustrates typical response distributions for the Monday and Saturday groups on a cluster of four items. Notice the lack of normality and more frequent extreme low scores in the Monday group.

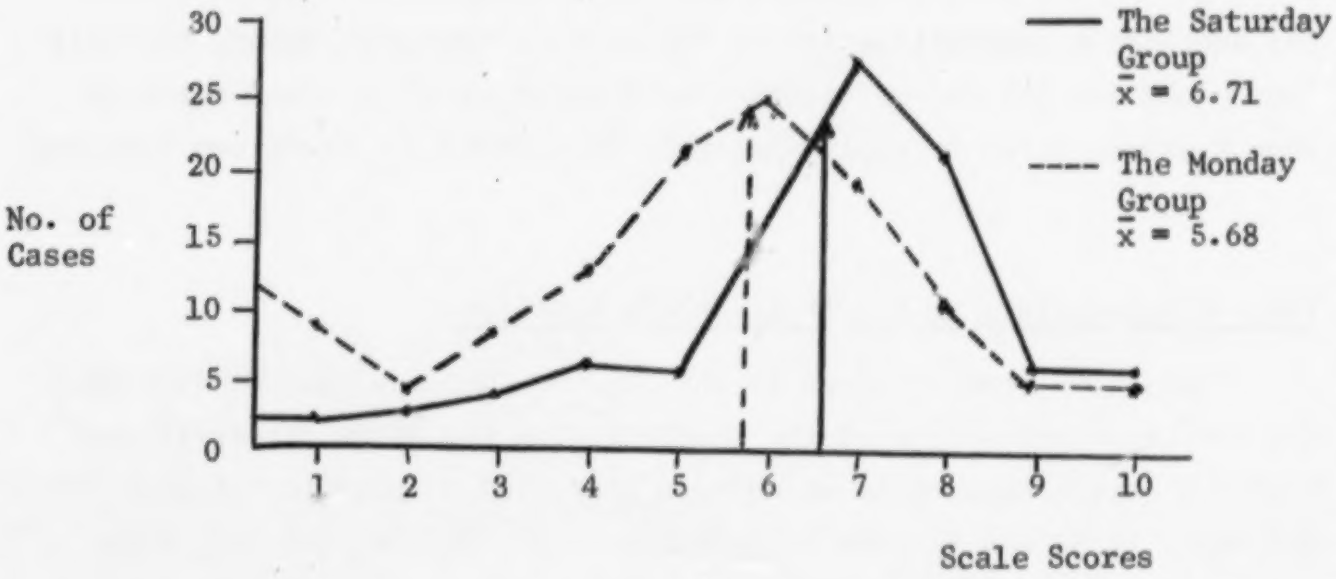


Figure 3.1

Illustrative Distribution on a PMRS Item Cluster

Our choice of a test of significance was finally the Kolmogorov-Smirnov test (KS) which is sensitive to differences in distributions and is superior to a median split Chi-square test in this application.

PMRS data were combined so that a single score represented teacher reactions for the first four weeks and another single score represented reactions for the remaining five weeks. There were several reasons for this decision.

First, the first four sessions were used to create two different training groups, in so far as the instructor's role was concerned, and during the last five weeks the teachers faced the consequences of the initial differences. Thus a single score for the first four weeks represented the teachers' reactions during the formative stages of the training program. These scores should not be contaminated by the individual successes and failures which were, in fact, consequences occurring during the second period of the program.

Second, the item responses on successive administrations during the first four weeks showed high positive correlations. Item correlations during the second five-week period were higher than those between the first and second periods. There were two trends to be accounted for: (a) increasing crystallization of the initial reactions during the first four weeks and (b) the maintenance or deterioration of these patterns when teachers tried to apply what they had learned to their own teaching.

Teacher Perceptions of the Instructor's Behavior.

Four items were combined in the PMRS to form a single measure of the teachers' perception of the instructor on the basis of significant positive intercorrelations which were presented on page 53, Chapter Two. The exact items can be seen in Appendix C (2A, 5A, 7A, and 9A), here it is enough to summarize their content by stating the question implied by each item; (a) Were the problems or ideas before the group at this session determined by the instructor or by the participating teachers?; (b) Were the activities of this session controlled primarily by the instructor or by the participating teachers?; (c) Was your participation at this session stimulated primarily by the instructor or was it self-generated?; and (d) Was the progress made at this session due primarily to the instructor or to your own determination? Means were calculated for this cluster of items by combining the scores over four weeks, over the remaining five weeks, and then for the entire program. The data are shown in Table 3.4.

A single item is also included in Table 3.4 which concerns whether the teachers perceived the instructor as formal and impersonal versus informal and interested in the teachers. The reaction to this item was not included in the instructor cluster because of lower intercorrelations with the other four items.

The data in Table 3.4 indicate that the teachers perceived the differences in the instructor's direct and indirect influence.

Table 3.4

TEACHERS' PERCEPTIONS OF THE INSTRUCTOR'S ROLE

Item	Group	Combined Mean Perception Scores		
		First four weeks	Remaining five weeks	Total Program
Four item cluster (2A, 5A, 7A, 9A) on instructor (a)	Saturday (Indirect)	4.63	4.71	4.68
	Monday (Direct)	6.25	5.49	5.83
Kolmogorov-Smirnov Test		$X^2 = 69.19$ $< .001$	$X^2 = 19.18$ $< .001$	$X^2 = 69.59$ $< .001$
Formal (b) vs. Informal	Saturday (Indirect)	3.06	2.93	2.99
	Monday (Direct)	3.91	3.82	3.86
Kolmogorov-Smirnov Test		$X^2 = 8.88$ $.02 > .01$	$X^2 = 6.12$ $.05 > .02$	$X^2 = 12.25$ $.01 > .001$

(a) Scores on four items combined; scale from 1 to 10, higher scores refer to instructor dominated.

(b) Scores for single item; scale from 1 to 10, higher scores refer to more formal.

Teachers' Perceptions of the Situation.

A number of items were concerned with the teachers' perceptions of the training situation. Three of these items are shown in Table 3.5. The first of these is concerned with whether or not the teacher feels free to express ideas or feelings; the second, raises the question of

TEACHERS' PERCEPTIONS OF THE SITUATION

Item	Group	Mean Perception Score		
		First four weeks	Remaining five weeks	Total Program
feeling free to speak out (a)	Saturday (Indirect)	2.93	2.52	2.70
	Monday (Direct)	3.36	3.37	3.36
Kolmogorov-Smirnov Test		$X^2 = 2.46$ N.S.	$X^2 = 12.21$ $0.01 > 0.001$	$X^2 = 13.57$ $0.01 > 0.001$
theoretical vs. practical (b)	Saturday (Indirect)	3.54	3.46	3.49
	Monday (Direct)	4.60	4.77	4.69
Kolmogorov-Smirnov Test		$X^2 = 8.53$ $.02 > .01$	$X^2 = 30.44$ $< .001$	$X^2 = 32.86$ $< .001$
ideas vs. attitudes (c)	Saturday (Indirect)	5.06	4.91	4.98
	Monday (Direct)	5.98	4.82	5.36
Kolmogorov-Smirnov Test		$X^2 = 6.82$ $.05 > .02$	$X^2 = .096$ N.S.	$X^2 = 2.17$ N.S.

(a) Single item; scale from 1 to 10, higher scores refer to not free.

(b) Single item; scale from 1 to 10, higher scores refer to more theoretical.

(c) Single item; scale from 1 to 10, higher scores refer to emphasizing ideas.

whether the content had practical or theoretical value; and the third, whether ideas about teaching or the teacher's feelings about these ideas predominated.

With regard to feeling free to speak out, teachers felt much the same in either group at the end of the first four weeks, but during the last five weeks the scores of the Saturday group decreased sufficiently so that a test of the entire program proved significant.

There were no differences between the groups with regard to perceiving the program as emphasizing ideas about teaching compared with the attitudes one has toward these ideas during the latter half of the program. The Saturday group was slightly more aware of an emphasis on attitudes during the first four weeks.

Among these three items, feeling free to speak out is the most straight-forward and it is interesting that the shift in the latter half of the program was a feeling of greater freedom among Saturday teachers. The scale obviously suffers from a"ceiling effect", or, to put it another way, nearly all teachers marked the item toward the"feeling free"end of the scale.

Teachers' Evaluation of Inservice Activities.

Two items were combined into a single scale, justified by both content and positive intercorrelations, in which teachers were asked to rate the value of the training activities. One item asked teachers to compare the inservice activities with other education courses they may have taken, the second asked if the activities were of direct help in classroom teaching. Teachers in the Saturday group consistently gave higher ratings compared with the Monday group. All teachers, however, established an average that was higher than the midpoint of the scale. The data supporting these statements can be found in Table 3.6

On the first page of the PMRS teachers were asked to rate various activities. The results are shown in Table 3.7 in which higher scores reflect perceptions of higher quality. The reader may find the two non-

Table 3.6

TYPE OF INSERVICE TRAINING INSTRUCTION AND GENERAL REACTIONS TO THE INSERVICE TRAINING PROGRAM

Item	Group	Combined Mean Evaluations		
		First four weeks	Remaining five weeks	Total Program
(1) Compared with an equal amount of time in an average education course, I would rate today as follows.[a] (2) I would rate the material and experiences of today's session--in terms of helping me with my own teaching--as follows.[a]	Saturday[b] (indirect)	7.24	6.46	6.80
	Monday[b] (direct)	6.33	5.04	5.60
Kolmogorov-Smirnov Test		$\chi^2 = 24.53$ .001	$\chi^2 = 53.11$ .001	$\chi^2 = 76.08$ .001

[a] Evaluation Scale: from 1 (very poor) to 10 (magnificent).

[b] Scores for both reaction questions combined into one score.

significant comparisons from the first four meetings in the rating of filmstrips, tape recordings, and lectures most interesting. These appear in the middle of the table.

It was, of course, the intent of the instructor and the training staff to produce the best possible directive training in the Monday group and the best possible indirect training in the Saturday group, but the difference between intentions and action has already been seriously questioned in this report. Was there an unknown bias in favor of the Saturday group in the demeanor of the instructor or the training staff not a part of the experimental design? If this were so, there would be an unfair test of the major

Table 3.7

TYPE OF INSERVICE TRAINING INSTRUCTION AND EVALUATIONS OF INSERVICE ACTIVITIES THAT WERE PART OF THE REGULAR SESSIONS

Item	Group	First four weeks		Remaining five weeks	
		Mean Evaluation (a)	K-S Test (b)	Mean Evaluation (a)	K-S Test (b)
Demonstrations, Role playing, or Panel Discussions	Saturday (indirect)	7.07	$X^2 = 10.11$ $0.01 > 0.001$	6.71	$X^2 = 14.30$ $< .001$
	Monday (direct)	5.95		5.38	
Filmstrips or, Tape Recordings	Saturday (indirect)	5.55	$X^2 = 1.87$ N.S.	5.67	$X^2 = 58.16$ $< .001$
	Monday (direct)	5.04		2.07	
Lectures and talks given by the staff	Saturday (indirect)	7.05	$X^2 = 1.97$ N.S.	6.87	$X^2 = 9.73$ $0.01 > 0.001$
	Monday (direct)	6.76		5.91	
Group Discussions that were a part of the regular sessions	Saturday (indirect)	7.18	$X^2 = 12.22$ $0.01 > 0.001$	7.19	$X^2 = 25.37$ $< .001$
	Monday (direct)	6.22		5.89	

(a) Evaluation Scale: Ranges from 1 (lowest value) to 10 (highest value).

(b) Kolmogorov-Smirnov Test of Significance (at 2 degrees of freedom).

hypotheses of the study.

Consideration of all the data available leads the staff to the conclusion that no such bias existed. First, the two matrices (see Tables 3.1 &.2) revealed the specific differences in the verbal behavior of the instructor. These were consistent with the demands of the experimental design. Second, the use of time within the two programs was approximately equal, except for differences that were an integral part of direct and indirect influence patterns. Finally, Table 3.7 shows that at the end of the first four weeks ratings of the lectures, filmstrips and tape recordings were not significantly different. True, the means are higher in the Saturday group, but well within chance expectations. Even the filmstrips, which were identical in every respect, received slightly higher ratings by Saturday teachers. In general, all teachers in both groups produced average ratings that were favorable to the training program.

The significant differences in favor of the Saturday group with respect to demonstrations, role playing and panel discussions, shown in the first row of Table 3.7, and similar results with respect to group discussions held during the regularly scheduled sessions, shown in the fourth row, were to be expected. By the third and fourth weeks of the program the superiority of these activities in the Saturday group were apparent to members of the training staff. By then teachers in the Saturday group were already beginning to take some initiative in planning and entered into these activities with greater enthusiasm.

The significant differences between the two groups in the remaining five weeks with regard to lectures and filmstrips, shown in the right hand columns of Table 3.7, will be dealt with in more detail in Chapter Five. For the moment, one need only note that these differences became significant primarily through some kind of "disenchantment process" within the Monday group. This process took place during the last five weeks of application and evaluation. This was a period in which teachers were supposed to be applying what they had learned from inservice training to their own classrooms. The more directive teaching procedures of the Monday group, similar with, but rated superior to, regular education courses, had taken its toll towards increased dependence and lack of initiative among teachers in the Monday group. They had a grasp of the content, but were not adequately prepared to provide the self-direction which is demanded by genuine self-inquiry and experimentation.

Summary of Teachers' Perceptions.

The teachers' perceptions, collected by PMRSs at the end of each training session, present a picture that is consistent with our earlier research involving classroom teachers and their pupils. Sustained patterns of direct influence erodes constructive attitudes toward learning, and, we believe, increases the dependence of the learner on the instructor. Evidence of these relationships at younger ages has already been established. Finding similar results with adult learners merely maintains the consistency of research findings.

Subjective Comments Made By Teachers in the Tape Recorded Evaluation Discussions

In this section selected quotations will be presented and interpreted which were transcribed from tape recordings made on the last day of the inservice training program.

The procedure used to form small discussion groups was the same in both the Saturday and Monday sessions. At a coffee break, following some evaluation tests, teachers were asked almost in the sense of a parlor game, to divide themselves into three groups of approximately equal size. Those who talk the most were to be in one group, those who talk the least in another group, and those who were not in either extreme were to form the third group. The reactions to these instructions included a great deal of good-natured humor. The one or two individuals who pretended to go into what was obviously the wrong group were quickly rewarded by loud reactions from their fellow teachers. Although there is no way of verifying this self-selection process, the subjective judgement of the staff was that the procedure did help isolate the above-average verbal participant from the below-average participant.

After the groups had formed they were taken to separate rooms and asked to discuss what they had gained, if anything, from participating in the program. A tape recorder, which was in plain sight, was turned on, and then the staff member left the room. The groups carried on until they were told to stop some 15 or 20 minutes later.

The reader is warned that no objective method was used to select any portion of a recording for inclusion in this report. The only certain objective fact is that the statements selected were made in spontaneous conversation by a single individual some five weeks after the initial sessions, and after a three-week period devoted to application and experimentation. The opinions or sentiments expressed did not necessarily represent those of the entire group because no consensus or agreement was required. They are included in this report merely to let the reader become familiar with whatever "local color" may be inferred from the statements of individuals who participated in the program.

This material will be presented in four parts: first, comparisons between Monday and Saturday groups are made; second, positive reactions from all six groups are illustrated; third, negative reactions from three Saturday and two Monday groups; and fourth, the negative reactions from the third Monday group will be interpreted.

All statements taken from the tape recordings will be typed within quotation marks, all other comments are those of the authors. A series of periods (. . .) will be used to represent parts of a statement left out; this will be done whenever it is possible to conserve space without changing the meaning of the speaker. Slash marks (//) will be used to denote one speaker interrupting another, a common practice in several of the group discussions; a series of plus signs (+++) will be used to indicate a new voice.

Comparisons between Monday and Saturday groups:—Most of the statements made in the six discussions involved the following topics: the tests which had been administered just before the coffee break; the positive or negative outcomes for an individual participant; criticisms, compliments, or arguments about the quality of the program; opinions about the training versus the research aspects of the entire project; and discussion about teaching, being indirect or direct, and the consequences of teacher behavior.

Even the most casual listener, for example, someone who knew nothing about the project, would probably have little difficulty classifying the six recordings into two groups of three each and by so doing would separate the Monday from the Saturday recordings. Incidentally, at the time this manuscript was written, a fair test of this assertion had not been made.

Those of us who listened to the recordings gained the impression that one theme was prominent in all six. This theme was the discrepancy between what the teachers wanted to talk about and what they were told to talk about. They were told to discuss what they had gained, if anything, from the inservice training. In certain segments of each recording, there is evidence that they complied to this request. But there was a major difference between the Monday and the Saturday groups with regard to what they wanted to talk about and this, in turn, affected each group's ability to evaluate individual progress or lack of progress.

In the Saturday group discussions, the tendency was to continue the course, in a sense, and discuss the strategy of teaching, the effects of direct and indirect teacher behavior, the technique of interaction analysis, and how it might be used or misused by administrators. Most of these topics were digressions which were not actually in conflict with whether or not a teacher gained something from the inservice training.

In the Monday groups the tendency was to discuss why and how their program was different as compared with the Saturday program, and why their group seemed to be less effective than the Saturday group, usually in defensive terms. They also argued about real and imagined conflicts between the research and training aspects of the total project. Most of their opinions on these topics were expressed so as to be consistent with the perception that the Monday group did not gain as much as it should from the inservice training. Both their topical digressions and their statements about personal evaluations interacted to produce more frequent criticism of the training and negative comments about personal growth.

In all six recordings, except for one episode in a Monday discussion group which will be considered later, there was a similar process for dealing with extreme statements, whether they were positive or negative. As soon as an extreme statement was made, subsequent remarks tended to modify the extreme position. Because positive attitudes and perceptions were held by a higher proportion of the members in the Saturday discussion groups, extreme positive statements were initiated more often and modified less severely. Because of the opposite conditions in the Monday discussion groups, however, extreme negative statements were expressed more frequently and modified less severely.

Examples of positive statements from all six recordings:--The illustrations were chosen so that at least one statement came from each recording.

+++ " . . . The important thing that has happened, I think, is that we have broken down the sanctuary of the classroom. Where the person felt defensive about somebody walking into the room, I feel no qualms at all about walking into half a dozen classrooms during the . . . day . . . we feel the freedom to walk into somebody else's classroom without being defensive . . . people are welcome to walk into mine and I think this is one of the first steps toward improving teaching . . ." (from a Saturday group)

+++ "I learned something that I could have learned in no other way. I learned how to say no to a child or disagree with him without hurting him . . . It is this idea about selective re-enforcement. . ." (from a Monday group)

(A teacher asked if anyone "had an observer" meaning did anyone in the group work with an observer during the application period. In response a teacher said:) +++ "I think that is the key to the whole thing. . . . he came in and he knew what he was talking about. . .we discovered things about my teaching that I never thought of before. . .in particular we were trying out different verbal patterns in two different classes. . . It wasn't just a case of being direct or indirect" (from a Monday group)

+++ "If you are in a school where everyone is doing it (meaning to participate in inservice training). . .and you know that they are bringing in observers. . .so you wonder, well, what should I do? It's like the measles, it's catching. . .this kind of affects the whole school. We've been aware of this problem before -- that there is so little interaction between teachers. . .The effect of this may show up more next year." (from a Saturday group)

(A teacher responds to the topic of how permanent will any changes be) +++ "I think . . .(it is). . . difficult to evaluate or analyze at this time. We mentioned that last three weeks or so. I think in the last three weeks. . .there has been a great deal of working with the observers. I had an observer in two or three times and this has been helpful to me. . .I spent an hour Thursday talking over a matrix. . .and I learned a lot. But it will take me quite a while to find out how much I've learned." (from a Saturday group)

(During an argument about the purposes of the training.) +++". . .but the inservice training course was not designed to tell you how to teach. This is not the purpose. All that we are trying to learn here is that we can measure our own behavior, if we want to. . .If something is going wrong, we have a way of finding it out." (from a Monday group)

(During a discussion of inservice training procedures.) +++ ". . . (how) grade level, all the way from kindergarten to college. . . is related to motivation. By college we assume that most people are self-motivated. . . perhaps the college instructor would be more justified in using maybe almost entirely direct (influence), or would he be? I'm not sure. . .It seems like these things always come back to motivation, and indirection (being indirect) seems to be one path to motivation.". . . +++ ". . .but we're educated (mature) people. . .(yet) it seems to me that it's only because it's indirect (meaning the inservice training) that I've gotten out of it what I have." +++ ". . .this (inservice) class had to be indirect because of the subject matter that was being taught." (from a Saturday group)

Examples of negative statements from five recordings:--Here, three Saturday and two Monday groups will be discussed in turn.

+++ "I've yet to hear too many adverse comments. . .with regard to this course. . .but it seems to me that it can't be that good. (laughter) I'd like to state that I could get more out of this if it would have been started at the beginning of the year. . .to use in classes initially. . . I think it was too much jammed into a short period of time." (This was the most critical statement in the entire recording of one Saturday group.)

In a second Saturday group, there were really no critical statements. The discussion consisted mainly of arguments about whether more flexible, indirect patterns of teacher behavior apply equally well to the different subjects taught.

We now turn to the third Saturday group.

+++ ". . .However, in my own case, I feel that what I have gained, I gained after about the first three sessions. Now that may well be my own fault because I have not been actively reading or experimenting. . . Since that time, it has been putting in time for me." +++ ". . .I would say that the reverse has been true for me because I do think the experimentation did help. . .I. . .learned more as time has gone on." +++ ". . . The course set up some high expectations the first three weeks, the last few weeks may not have been quite as productive. . .the fact that we were to go over our own records to see what we had done in class. . .some of us who didn't get a chance to experiment. . . (for us) the class didn't mean as much. . .If they could have had more information ready for us. . . (we could have). . .gained more." (These were the most negative comments from the third Saturday group. This group also expressed a fear that the administration would use this project inappropriately to evaluate teachers.)

We now turn to the first of the Monday groups.

+++ "In a practical sort of way where are we going to get matrices? I couldn't get even anyone to come and observe. Now, I admit that I could have asked oftener, but we just didn't get around to it. They couldn't come during the times that I asked. . ." +++ ". . .now the day she was in (an observer) the students talked 58 per cent of the time. Now this is quite a bit. You know actually just being honest, . . .I would feel almost the opposite. . .(perhaps the observer had made the mistake of complimenting the teacher on high pupil participation, the teacher goes on --) I really mean it. I can throw a question and just let them throw garbage for an hour, and at the end of the hour you could probably sum up what they got in the first five or ten minutes. . " +++ ". . .but, I wonder if it's necessary to spend a whole forty hours doing this? I felt that the first three or four meetings were very beneficial, and after that I wondered what we were doing there!" +++ "I wasn't completely familiar with how a matrix was built. I think this is one place where many of us lost interest in later sessions because we're really not that interested in statistics. For instance, take me with a liberal arts background. This is totally unrelated with what I'm interested in. Sometimes I think I'm out of my field when they're talking about interpretations of matrices." (all of the above statements were from the same Monday group.)

We now turn to the second Monday group.

+++ "I just don't believe that I've made any changes in my own behavior as a result of participating in this inservice training course. . . .I could have put more into this program and then perhaps there would have been a change. I think the program definitely has possibilities. I think that I missed something someplace along the line of the program. I understand these matrices now; I understand these ten categories, but I don't think it made a great change in my teaching." +++ "I was so disappointed in one thing, I had the understanding that when we took this course we had probably the greatest opportunity of our lives to find out really what type of teacher we were and I feel that I didn't find out. . . .the matrices that were made in the fall aren't available and never will be as I understand, so we really haven't found out, at least I haven't." (An argument follows as to whether or not insight into one's own behavior was to come from experimentation rather than the fall observations. Opinions are both pro and con.) +++ ". ...to me the last four meetings have been a waste of time." (There were additional critical statements of two members of this group who had extensive experiences during the application period with observers. Their more positive statements tended to control criticism within certain limits as well as stimulate some statements of guilt, such as, "Well, I guess I just didn't do my share.")

The third Monday group will be dealt with in the next section.

An example of uncontrolled criticism:--This third Monday group started on a critical note when one teacher bluntly interrupted the first teacher who started to talk, by saying: "One question. How many do you feel really put a lot into it? I'm always under the assumption that you don't get anything out of something you don't put anything into. And I feel that this Monday night business. . .I'm just not alive on Monday night in the first place." After discussing how hard teachers did or did not work, the topic shifted to motivation.

+++ ". . .Now in graduate school. . .whether you want it or not, whether you're motivated or not, dog-gone-it, you've got to sit down and do that work. Your basic motivation is to pass that course."

+++ "There was no motivation to pass this course, we were all guaranteed a grade of B at the beginning." (about three or four minutes later, after a few positive statements, the group returned to the same theme.)

+++ ". . .but did you do all the reading in all the manuals? And did you understand the matrices completely and go into the interpretations of it?"

+++ "I can't say I did, no //"

+++ "I wish he had given us some assignment, some actual reading assignment in the material he handed out. There is nothing that will . . .well, prod me to read than to say that I must do something. But this 'at your convenience' type of thing (imitating the instructor), I never quite get around to be that convenient."

The conversation turned to further opinions about the Monday and Saturday groups. The tempo, excitement, and strength of expressed convictions increased, until at times several people were speaking at the same time. One interesting burst of what might be called uncontrolled criticism is shown below. The discussion just preceding this episode was an argument about what had been said by the instructor about being direct and indirect in the classroom. Some said that nothing of practical value had been advocated by the instructor. Another countered that -- "indirect influence is best for teacher-pupil planning, student conferences about grades, finding out what is wrong with a work group, and so forth. What more can you get?" This led to further argument in which one teacher insisted that whatever hypotheses he may have had about his own teaching, he was denied access to information with which to test his hypotheses. This was presumably a reference to lack of access to fall interaction analysis data or pupil scores on the MSAI. He concluded with the following words.

+++ ". . .so that as training, we had no way of testing it. That's why there is such a. . .vague feeling about it, we can't identify what we've done. What are we training for? . . .We might just as well have run mazes, we'd learn just about as much!"

+++ "So we learned the maze. So what! We don't know whether we got the meat or not!"

+++ (whispered in background) "No. No. No."

+++ "I think that one of the problems is that the course itself seems so loosely organized. What was covered in this course could have been covered in two or three concentrated sessions. And the problem in my mind, at least, and I think in some people's, is that it looks much more important than what I seem to be getting out of it that -- what are we doing here? (In the recording, the tempo here is best described as a gush of words) I try to figure out what did I get tonight and I really didn't get anything much!"

+++ "I think we're typical in our negative attitude, and the opinion has been expressed before that the Saturday group looks down their noses at us!"

+++ (in a high, excited, dramatic voice) "Yes!! And they are so happy! And they want to go on and do more work!"

+++ (start of this statement hidden by above voice) ". . .and we didn't"

+++ (former voice continuing) ". . .as if you are out of your mind!"

+++ "Of course rumors always fly, but I have heard many, many rumors that there have been some things lacking on the Monday nights that were on the Saturdays. One of those was the use of three." (This is a reference to category three the instructor accepting and clarifying ideas.)

+++ "What is three?"

+++ "Praise and approval // . ." (praise and approval is category two.)

+++ ". . .by Flanders."

+++ "You mean two."

+++ "Is it two?" (much confusion and laughter)

+++ (strong voice overrides confusion) "ONE, TWO, AND THREE!" (More laughter and continuing confusion; occasional words can be identified such as "no praise" and "we forgot".)

+++ ". . .and for the first three weeks that he didn't use a one, two, or three in our class, and he was using just all sorts of them in the Saturday morning class. (peevishly) And they got all this exuberence and hooray and let's go and we've got // . ."

+++ ". . .and we got (pause) UGH!"

(former voice continues) +++ ". . .that group! They're running around with tape recorders, and going into each other's rooms, and helping each other out, and I don't care if any ever comes in my room." (laughter)

After the group simmered down a bit, they returned to the original question of what each person gained, if anything, from inservice training. This is called uncontrolled criticism because extreme statements remained unmodified by subsequent remarks. In fact, each contribution increased excitement and stimulated further exaggerations. Probably no more than five or six contributed to this short period of excitement. Calmer voices took over following this episode.

If these recordings show nothing else, they show the range of individual feelings that were aroused by the original request. The reader, of course, is free to draw his own inferences regarding these tape recordings. Our inferences will be evident in the concluding section of this chapter.

A Summary of the Analyses of the Control Data

We have attempted to show that the major effort to create two learning situations, one involving more flexible and indirect influence by the instructor and the other involving less flexible and more direct influences by the instructor, occurred during the first four weeks. During this first period of the inservice training programs, there were four meetings, each four hours long. During each four-hour session several rooms were used, teachers got up and walked from one room to another and found themselves in different formations appropriate to lecture-discussions with the instructor, to viewing sound filmstrips, to having a coffee break, and to conducting self-directed small group discussions or demonstrations. In this manner there was considerable variation within each four-hour session. We have presented data to show that the time devoted to these activities was essentially the same in the Monday and Saturday groups, except that in the lecture-discussion formation with the instructor, there was a higher proportion of lecture in the Monday group.

The specific differences in the verbal influence of the instructor were shown in the composite matrices of verbal interaction. In the Monday group lecture was used more often to identify ideas and to expand and illustrate these ideas. The instructor took the initiative in pointing out ways that the technique of interaction analysis could be used for self-inquiry and classroom experimentation. In the Saturday group, lecture was used to introduce the same ideas, but questions soon stimulated teacher reactions which in turn provided illustrations and permitted teachers to take greater responsibility in planning self-inquiry through classroom experimentation. The sound filmstrips and observer training were essentially the same in both programs.

The differences in the role of the instructor in the Monday and Saturday groups were clearly seen by the teachers at the end of four weeks. At this time they rated the course, the lectures, filmstrips and group discussions above average on a ten point scale. They felt free to express their own ideas in both programs and were generally enthusiastic. It is our theory that this general enthusiasm was based on different relationships between the instructor and the participating teachers; Monday teachers were expecting that additional insights would come from the staff and the head instructor; Saturday teachers were expecting additional insights to come from their own experimentation with less direct help from the staff. Monday teachers were told that they would have to apply these ideas themselves and that they would be able to schedule staff observers and share observations with each other. Saturday teachers were also given the same information, but the method of instruction led some of the Saturday teachers to believe that they had a greater share in the entire enterprise. In terms of our theory, the Monday teachers were more dependent on instructor direction; the Saturday teachers were more independent.

Creating these two conditions by the end of the fourth week was essential to the test of the compatibility hypotheses. We wished to discover whether certain types of teachers would show more change in behavior in the Monday treatment and whether other types of teachers would show the most gain in the Saturday treatment.

We now turn to the next chapter in which the data relevant to our hypotheses have been analyzed.

References

1. Darwin, J. H. "Note on the comparison of several realisations of a markoff chain", *Biometrika*, 1959, *46*, 412-419.
2. Storlie, T. R. *Selected Characteristics of Teachers Whose Verbal Behavior is Influenced by an Inservice Course in Interaction Analysis.* Unpublished doctoral dissertation, University of Minnesota, December, 1961, pp xii + 209.

Chapter Four

THE RESULTS OF THE INSERVICE TRAINING

Introductory Remarks

Although the original design of the project and the usefulness of the control group deteriorated, as was explained in Chapter Two, page 32, our procedure will be to report all the data, including the control group, in order to permit the reader to draw his own conclusions. Before turning to the four compatibility hypotheses and the hypothesis concerned with satisfaction, some attention will be given to the data from the Monday, Saturday, and Control groups.

The most complete picture of the interaction analysis data can be obtained from an analysis of the composite matrices of these three groups for both fall and spring. The six matrices, converted to a common base of 1,000 tallies, are shown in Appendix A. The first comparison usually made of a matrix concerns the per cent teacher talk, pupil talk and silence. These figures are shown in Table 4.1.

No significant trends are apparent in the per cent figures shown for the fall and spring observations of the Saturday, Monday and Control groups. This table reflects all the tallies in all of the observations without regard to whether one teacher was observed for slightly longer periods of time than another, thus, the matrices are a composite of all events observed in all classes.

The differences in the quality of teacher talk can be seen in Table 4.2.

Table 4.1

PERCENT OF TEACHER TALK, PUPIL TALK AND SILENCE IN THE FALL AND SPRING OBSERVATIONS OF SATURDAY, MONDAY, AND CONTROL TEACHERS

Group	Teacher Talk		Pupil Talk		Silence	
	Fall	Spring	Fall	Spring	Fall	Spring
Saturday	69.8	67.7	22.4	26.9	7.8	5.4
Monday	66.6	66.2	27.4	28.9	6.0	4.9
Control	68.8	71.8	24.5	22.2	6.7	6.0

Table 4.2

CHANGES IN I/D AND i/d RATIOS FALL TO SPRING FOR THE SATURDAY, MONDAY AND CONTROL GROUPS

Group	I/D			i/d		
	Fall	Spring	Gain	Fall	Spring	Gain
Saturday	.262	.363	+.101	.724	1.75	+1.026
Monday	.373	.337	+.014	1.05	1.52	+0.47
Control	.299	.377	+.078	.667	1.95	+1.283

The increase in the Saturday group I/D ratio is about seven times that of the Monday group, with the Control group making about three-fourths of the Saturday group gain. Changes in i/d ratios show the highest gain for the Control group, Monday is smallest, but all groups show some gain.

The differences in Table 4.2 are ratios from matrices which are significantly different by a Darwin Chi-square test of significance. The two distributions of I/D gain scores, however , for the Saturday and Monday groups, were analyzed by a "t-test", since both distributions were normal, and were found to be not significant.

Reference to Table 2.9, which shows errors of I/D ratios for various reliability coefficients and total tallies, would lead one to guess that the maximum error in the gain measure due to faulty observation would be plus or minus 0.015.

The most reasonable inferences are the following: (a) that all three groups were significantly different in the quality of classroom teacher influence in the fall; (b) that there were significantly different gains or losses fall to spring; and (c) that the highest gain occurred in the Saturday group in terms of I/D, and in the Control group in terms of i/d. Confidence in these comparisons with the Control group is not justified, however, given the conditions outlined in Chapter Two. In addition, variability in i/d scores made this measure difficult to analyze.

A second more general comparison involves the attitudes of the pupils toward the teachers and toward the classes during the academic year of the project. The MSAI was administered to one morning and one afternoon class of each teacher once early in the fall, once near the end of the inservice training, and once late in the spring. A discussion of MSAI reliability can be found on pages 51 and 52, Chapter Two. The relatively large decrease in class averages, fall to spring, is illustrated in Figure 4.1 for the afternoon and morning classes of the three groups. This is the first evidence that measures of constructive pupil attitudes consistently decrease during the school year. This trend is statistically significant and consistent among all classes.

The seasonal losses in class averages for the three groups are shown in Table 4.3 for morning and afternoon classes, fall to winter and fall to spring. It can be seen from statistically non-significant trends that

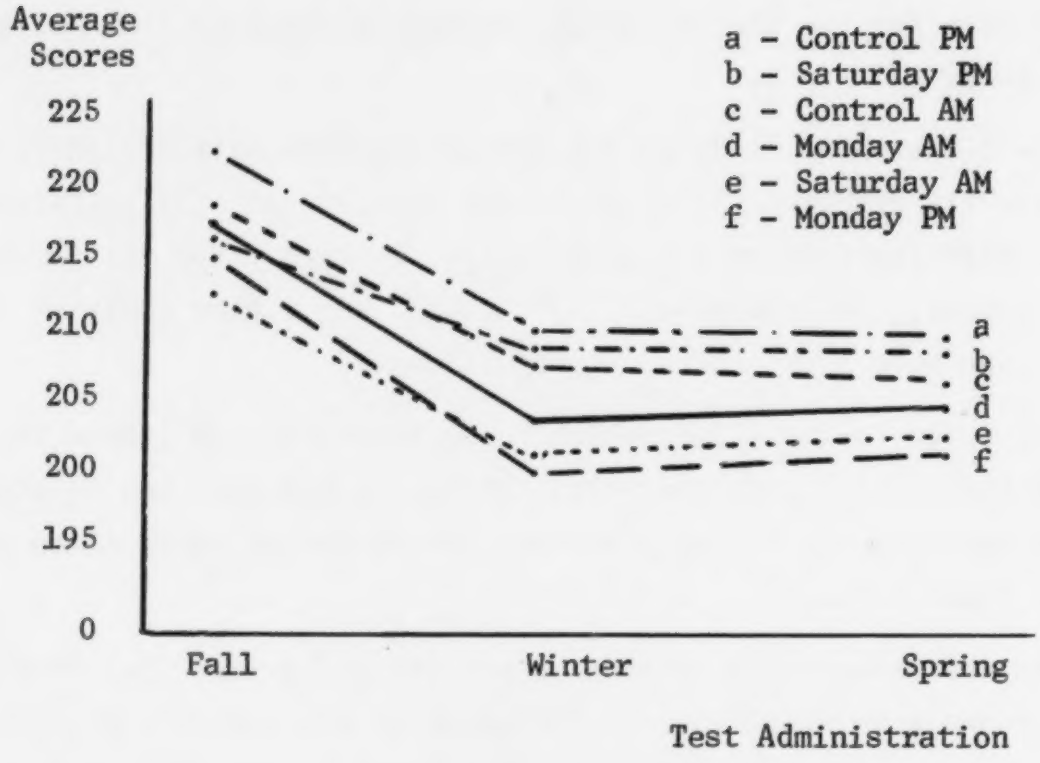


Figure 4.1

Pupil MSAI Scores

Saturday losses are smaller.

A quick way for the reader to estimate a significant difference between means, given a set of scores with a large "N" is by the use of the formula --

$$\text{C.R.} = \frac{(\bar{x}_a - \bar{x}_b) - (\bar{x}_c - \bar{x}_d)}{\left(\frac{\sigma_a{}^2}{N_a} + \frac{\sigma_b{}^2}{N_b} + \frac{\sigma_c{}^2}{N_c} + \frac{\sigma_c{}^2}{N_d}\right)^{1/2}}$$

With variances that vary from 48 to 1,263 and Ns that vary from 700 to 800, mean differences that range from 4 to 6 or greater will approach a chance occurance of less than one in one-hundred, depending on the particular distributions. Differences between two means from 2.5 to 4 or greater will also be significant.

The proper inferences from Table 4.3 are that the seasonal decreases from fall to winter and fall to spring are all statistically significant,

Table 4.3

FALL, WINTER, AND SPRING DECREASES IN CLASS MEANS ON MSAI MEASURES OF PUPIL ATTITUDES

Classes		Fall		Winter		Spring		Seasonal Changes	
		Mean	σ^2	Mean	σ^2	Mean	σ^2	Fall to Winter	Fall to Spring
Sat.	AM	212.9	453.4	200.2	134.6	202.4	640.2	-12.7	-10.5
	PM	216.0	251.1	209.1	974.8	208.0	284.2	- 6.9	- 8.0
Mon.	AM	218.1	105.0	203.9	162.8	204.3	550.9	-14.2	-13.8
	PM	214.4	856.8	199.7	1168.6	201.0	1263.0	-14.7	-13.4
Cont.	AM	219.5	308.5	207.9	1095.6	205.9	205.1	-11.6	-13.6
	PM	212.9	148.0	209.8	931.8	209.2	47.6	-12.1	-12.7

but the changes from winter to spring as well as differences between changes are not statistically significant.

The seasonal loss in measures of constructive pupil attitudes toward the teacher, the class, and the learning activities is quite interesting and not reported in the literature to the knowledge of the authors. Exactly what process takes place should make an interesting project for future study. As the year goes by do pupils reduce restraints in realistically perceiving and recording the classroom situation or is there a process of disenchantment?

To summarize, the changes in the ratios of indirect to direct teacher influence and the reactions of pupils to their teachers and classes have been shown for the Saturday, Monday and Control groups. Comparisons with the control group would have been useful to answer questions concerned with whether participation in the inservice training had any effects that were different from an ordinary one-year teaching experience. Questions of this sort cannot be answered for reasons already outlined.

We now turn to the compatibility hypotheses and a series of comparisons that have been diagramed in Table 2.1.

The Compatibility Hypotheses

The compatibility hypotheses are based on the notion that when the natural style of the teacher is consistent with the style of the inservice training instructor, then the objectives of the inservice training are more likely to be reached. It would not be efficient to consider these hypotheses one at a time, since all four together predict a rank order of increasing application of social skills, one group compared to another. Therefore, this section will be organized by the type of data under consideration and the particular variable that is being controlled, if any.

Both I/D and i/d ratios could serve as outcome variables. The i/d ratio has been useful in previous, similar research in which different subject matter classes were being compared, but it did not prove a consistent variable in the present study. Just why this turned out to be the case is difficult to determine, but is probably due to the variety of classroom activities in the spring observations. Table 4.4 shows that initial I/D was related to initial i/d, but that change in I/D was not related to change in i/d. Add to this the fact that only 63 per cent of all teachers made gains in I/D with an average of +0.065, while 82 per cent of the teachers made gains in i/d with an average of +1.366, and it is clear that change in I/D is a superior index of change when the purpose of the analysis is to make discriminations among the teachers in the Monday and Saturday groups. Nearly all the teachers increased their use of social skills as indicated by gains in the pre-and-post measures of the i/d ratio, but fewer of the teachers were able to integrate the increased use of social skills with subject matter in a way

Table 4.4

RELATIONSHIPS BETWEEN I/D AND i/d RATIOS

Initial I/D and i/d			Change in I/D and i/d		
Initial I/D	Initial i/d		Change in I/D	Change in i/d	
	Above Median	Below Median		Above Median	Below Median
Above Median	22	9	Above Median	19	12
Below Median	9	22	Below Median	14	17
$X^2 = 10.90; < 0.001$			$X^2 = 1.62$; N.S.		

that indicated an increase in the I/D ratio. Since our purpose in testing the compatibility hypotheses is to compare groups of teachers within the Monday and Saturday groups, the I/D ratio will serve as a better outcome variable.

Another outcome variable is change in flexibility. This variable forms a table in which initial I/D is related to initial flexibility in a manner that is identical to the left hand side of Table 4.4, except that the 9 in the upper-right-hand quadrant becomes 8 due to the loss of one case. Thus initial I/D and initial flexibility are positively correlated. In addition, change in I/D is related to change in flexibility since those teachers initially high in I/D had an average mean change in flexibility of +0.326 while those low in initial I/D had an average mean change of +0.069. This difference is nearly significant at the 0.05 level: K.S. - $X^2 = 5.21$.

Both I/D and the measure of flexibility will be used to indicate which teachers made changes in their patterns of teacher influence before and after the inservice training program. Changes in i/d will be noted when it seems appropriate, but this measure will not be consistently used in the analysis of the data.

Direct Test of the Compatibility Hypotheses.

The results of our first test of the compatibility hypotheses are shown in Table 4.5. There is only one difference among the outcome variables that is statistically significant, the indirect teachers in the Saturday group showed a higher mean gain than the indirect teachers in the Monday group.

Table 4.5

INITIAL TEACHING STYLE, TYPE OF INSERVICE INSTRUCTION, AND MEAN CHANGE IN I/D AND FLEXIBILITY

Type of Instruction	Initial Teaching Style (a)	Change in I/D		Change in Flexibility	
		N	Mean	N(c)	Mean
Saturday (Indirect)	Indirect	10	+.143	8	+.457
	Direct	15	+.077 (b)	10	+.422
Monday (Direct)	Indirect	16	-.040	15	+.217
	Direct	10	+.064	9	-.020
Control (no training)	Indirect	5	+.208	5	+.014
	Direct	6	+.067	6	-.282

a. Based on fall observations.
b. t = 1.82, Significant 0.05 at 24 d.f.
c. "N" for flexibility measure is smaller due to cases lost because too few class activities occurred during observation.

All four of the compatibility hypotheses would predict mean gain in the following sequence, most gain to least: indirect teachers in the Saturday group more than direct teachers in the Monday group more than direct teachers in the Saturday group more than indirect teachers in the Monday group. The results in Table 4.5 confirm positions one and four, the most and least gain positions, but the second and third positions are reversed.

The flexibility outcome variable is shown in the right hand column of Table 4.5. No statistically significant differences were present and the rank order of gain among the groups is not consistent with the compatibility hypotheses.

The data for the control group, at the bottom of Table 4.5, are included merely to show that most of the gain in I/D was due to those teachers who were classified as indirect on the basis of the fall observations. Apparently these indirect teachers made some progress in the increased use of indirect statements between the fall and the spring observations without the benefit of inservice training. The difference is not significant, however, due to the small "N" and score variability. This variability of scores tends to confirm the questions raised earlier about the adequacy of the control group.

Testing the Compatibility Hypotheses with Perception of Training Controlled.

In the PMRS questionnaires, a cluster of four items formed a scale to assess the teacher's perception of the role of the inservice instructor's behavior (see Table 3.4, page 65). Not all teachers perceived the instructor's behavior in the Saturday group as indirect and some in the Monday group saw the instructor as indirect. The majority in each case perceived the pattern of instructor behavior as intended. Teachers who misperceived the role of the instructor simply were not in the situation described by the compatibility hypotheses and therefore should not be included in a test of these hypotheses.

Table 4.6 adds the control variable of the teachers' perception of the instructor's behavior to the analysis of the outcome variables.

Table 4.6

INITIAL TEACHING STYLE, TYPE OF INSERVICE INSTRUCTION, AND MEAN CHANGE IN I/D AND FLEXIBILITY, CONTROLLED FOR TEACHERS' PERCEPTION OF INSTRUCTION

Perception of the (a) Instructor	Type of Instruction	Initial Teaching Style (b)	Row in Table	Change in I/D		Change in Flexibility	
				N	Mean	N(c)	Mean
CONSISTENT	Saturday (Indirect)	Indirect	1	7	+.160	6	+.007
		Direct	2	13	+.082 e d	9	+.463
	Monday (Direct)	Indirect	3	14	-.073	13	+.226
		Direct	4	7	+.087 f	6	-.022
INCONSISTENT	Saturday (Indirect)	Indirect	5	3	+.105	2	+1.806
		Direct	6	2	+.045	1	+.053
	Monday (Direct)	Indirect	7	2	+.193	2	+.158
		Direct	8	3	+.009	3	-.015

(a) Consistent: saw Saturday instructor as indirect, Monday as direct
Inconsistent: saw Saturday instructor as direct, Monday as indirect

(b) Based on fall observations

(c) Some cases missing due to insufficient data

(d) t = 1.898, significant 0.05, at 19 d.f.

(e) K.S., $X^2 = 8.79$, significant at 0.02, at 1 d.f.

(f) K.S., $X^2 = 6.09$, significant at 0.05, at 1 d.f.

Statistically significant differences now appear which give more definitive evidence regarding the four compatibility hypotheses.

The scores of teachers who perceived the role of the instructor as consistent with his intentions are shown in rows one through four. The indirect - Monday teachers made the least gain as predicted by the compatibility hypotheses. This gain is significantly lower than the gains of the other three groups. In addition, the rank order of increasing mean gain in I/D corresponds exactly with the expected rank order. This exact coincidence of the rank order of the four gain scores must be considered to be partly a matter of chance because the difference between the Saturday and Monday groups of direct teachers is very small. One must conclude that the more direct teachers responded almost equally well to the two different inservice training programs.

Hypothesis A is supported by the data in Table 4.6 because the more indirect teachers did make the most gain in the Saturday group. Hypothesis D is also supported because the indirect teachers who were in the Monday group made the least gain of all groups. Apparently the more indirect teachers are sensitive to the instructor's pattern of influence in an inservice training program.

Hypotheses B and C are not supported as they were originally phrased in Chapter Two because the more direct teachers made approximately equal gains in I/D in both the Saturday and Monday groups. Apparently the more direct teachers are less sensitive to different patterns of instructor behavior in an inservice training program. These teachers make significantly higher gains, in either group, when compared with the indirect teachers in the Monday group.

These comments about Hypotheses B and C must be modified somewhat by the observation that among the 15 Saturday teachers who were initially direct (below the median), nine were in the lowest quartile of the entire population. Only three teachers fell into this extreme classification among the ten direct teachers in the Monday group.

Not only were the direct teachers in the Saturday group more direct, but they were also initially less flexible than their counterparts in the Monday group. The incidence of extreme inflexibility, those falling into the lowest quartile of initial flexibility, for the Saturday group was eight; for the Monday group, three.

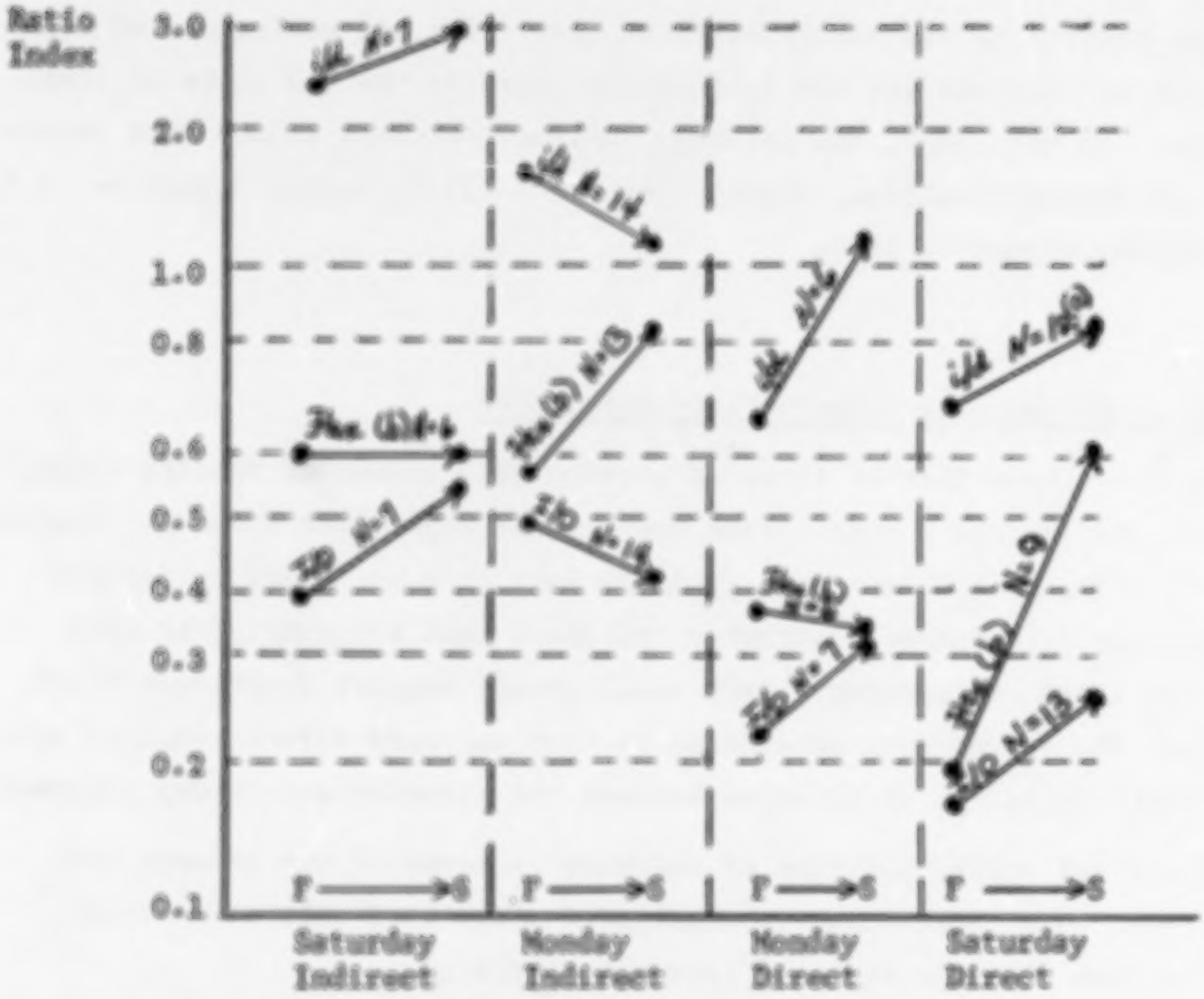
Thus the "equal" progress of the more direct teachers in the Saturday group, compared with direct teachers in the Monday group, was made in spite of an initial below average position for Saturday teachers. A more complete statement is that those teachers who were the most direct and inflexible, shall we say those in a position to benefit most from inservice training, made progress equal to teachers who were at less of a disadvantage when exposed to the indirect methods used in the Saturday group.

Throughout this discussion we have been talking about gain scores. Change in the quality of teacher influence must also take into consideration the initial patterns of the teacher before inservice training. Figure 4.2 plots initial position, gain or loss, and final end point of the same teachers for our three outcome variables based on those teachers who perceived the instructor's behavior consistently (see Table 4.6). The average gain or loss is shown as an arrow from fall (F) to spring (S).

The arrows in Figure 4.2 clearly show the differential effect of the indirect and direct inservice training on the initially indirect teachers. These initially indirect teachers made gains in both I/D and i/d when exposed to the Saturday (more direct) training, and made losses when exposed to the Monday (more direct) training. The measures of flexibility show a reverse trend.

The approximately equal gains in I/D of the initially direct teachers in the Saturday and Monday groups is also clearly shown. Note that the Saturday group was initially more direct and less flexible than their counterparts in the Monday group.

The only information that Figure 4.2 adds to the evidence already presented in support of the compatibility hypotheses is that even though the Monday indirect teachers are fourth in a rank order of gain in I/D, they are second in rank order in terms of the absolute level of spring average I/D ratio. These data suggest that a nine week inservice training program is limited. The initial style of the teacher appears to



(a) One gain in i/d of 52.8 ignored as spurious

(b) Small Ns for flexibility due to inadequate data; teachers failed to have enough different activities during fall or spring observations.

Figure 4.2

Average Fall and Spring Measures of I/D, i/d, and Flexibility of Teachers who Perceived Instruction Behavior Consistently

determine the final position which is achieved at the end of the inservice training.

Further support and more specific illustrations of the conclusions stated above can be found in the spring composite matrices of the teachers who perceived the instructor's behavior consistently. These matrices can be found in Appendix A, page 141. A typical comparison and one most directly related to the social skill of clarifying and making use of ideas expressed by students are the frequencies found in the 3-3 cells of these matrices. In this cell, the Saturday indirect teachers showed 32.1 statements per thousand tallies, Monday indirect -- 21.2, Monday direct -- 14.5, and Saturday direct -- 11.3.

Summary of Evidence on Compatibility Hypotheses.

We have shown that in terms of average gain scores of the I/D ratio, there is statistically significant support for Hypotheses A and D. Teachers who are initially indirect will gain the most from an inservice program that employs patterns of instructor influence that are consistent with their own style of teaching. Very small trends support Hypotheses B and C so that the appropriate conclusion is that our more direct teachers were less sensitive to the differences between the Saturday and Monday programs.

The final spring position of teachers in terms of the average I/D ratio seems to be more directly associated with their initial style of teaching than with the style of inservice training.

Taking into consideration the extreme direct qualities of the teachers classified as direct in the Saturday group, it seems reasonable to reach the following propositions with regard to the inservice training.

First, the more indirect Saturday program was superior to the more direct Monday program because of the greater gains of the initially more indirect teachers and the approximately equal gains of the initially more direct teachers.

Second, the Saturday program was also superior because the more extreme direct teachers, who were in the fourth quartile in initial I/D made the same gains as did teachers in the Monday program who were in the third quartile of initial I/D.

Third, there are statistically non-significant trends in which the gains in flexibility and i/d ratios were greater for those teachers who participated in the Saturday program.

Since the tests of the compatibility hypotheses lead to a general superiority of the more indirect Saturday program, the question of "why?" naturally arises. We will now turn to evidence from the PMRS concerning the perceptions of the teachers in both programs and to reports of self-directed activities associated with the program in order to attempt to answer this question.

Perceptions and Preferences of the Teachers

The perceptions of the teachers during the nine weeks of the inservice training have already been described in Chapter Three, pages 62 to 71. The reliability of these scales was discussed in Chapter Two, pages 52, 53 and 54. It has been shown that the scales are reasonably reliable, even though reliability measures vary from one administration to the next. The lack of normality of the data has been discussed. Significant differences between the Monday and Saturday groups indicated that the teachers gave higher general ratings to the Saturday program and perceived the behavior of the instructor as being more indirect. It was also asserted that the differences in perception were logically related to the overt behavior of the instructor as he created a more direct and a more indirect pattern of influence in the two programs.

In order to explain why the results of the compatibility hypotheses led to the conclusion that the Saturday program was, in general, superior to the Monday program for most teachers, we must now turn to the concepts of "satisfaction" and "dissatisfaction" with the inservice training. Ten items in the PMRS questionnaire permitted a teacher to not only record his perceptions of the training situation, but they also permitted him to indicate what he would have preferred regardless of what actually existed. The concept "satisfaction" refers to no difference between what is perceived and what is preferred. The concept "dissatisfaction" refers to a difference between what is perceived and what is preferred.

The Distribution of Discrepancy Scores.

The difference between what is perceived and what is preferred is a discrepancy score. Item three of the PMRS will now be used to illustrate a discrepancy score. The item reads (see Appendix C): "Assuming that we could emphasize content (ideas about teaching) or we could emphasize attitudes (our feelings about these ideas), how would you rate the session TODAY?

a) Mark your appraisal of TODAY'S session, as you saw it.

b) Now indicate what you would have preferred TODAY."

Following each direction, a and b, a teacher made a check on a ten point scale: the low end representing a perception of mostly attitudes and the high end representing a perception of mostly ideas. In Chapter Three, the analysis was devoted exclusively to the "a" response, i.e. what was actually perceived. In this section we will be concerned with the difference between the "a" and the "b" response, i.e. the discrepancy score.

A fairly typical distribution is shown in Figure 4.3 for item 3, on the fifth meeting of the two groups. This particular session occurred during the application or work period when the session was two hours long and was concerned with discussing how the teachers were progressing in their attempts to apply the ideas which they had learned in inservice training. In the Saturday group most of the meeting was concerned with discussing several matrices which various teams of teachers had prepared. In the Monday meeting, several teachers who had been observed by staff members reported their experiences and these were discussed. In both groups the instructor's role was to help clarify both the attitudes and ideas in these reports and help reach generalizations about teacher influence and self-experimentation in the classroom.

Since the "a" response is always subtracted from the "b" response, negative scores represent a preference for more emphasis of ideas and positive scores show a preference for more emphasis of attitudes. A zero discrepancy score indicates no difference between the emphasis perceived and the emphasis preferred. The distribution shows that most of the teachers

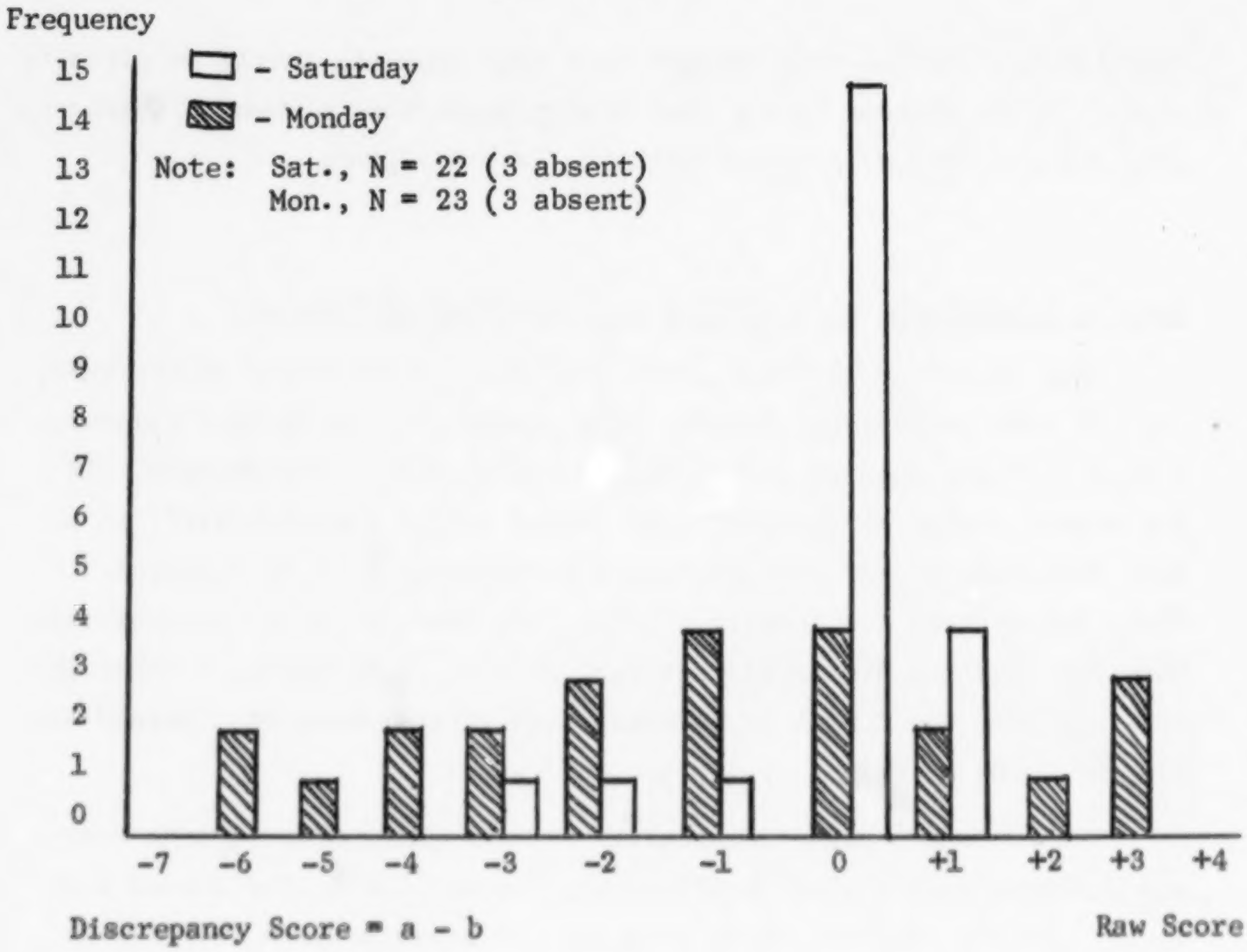


Figure 4.3

Discrepancy Scores for Item Three, Fifth Week

(N = 15) in the Saturday group were satisfied with the existing balance in emphasizing attitudes toward and ideas about applying what had been learned. Only four teachers recorded the same response in the Monday group. All the other teachers were dissatisfied and would have preferred a different emphasis.

With discrepancy data, we found so many non-normal distributions that special analysis seemed to be necessary. It was proposed that a conservative procedure would be to designate all zero scores as "satisfied" responses and all other scores "dissatisfied" responses, ignoring degrees of dissatisfaction. In the instance illustrated in Figure 4.3, when both groups are combined, ten teachers were dissatisfied because they thought more emphasis should be given to attitudes, and seventeen teachers were dissatisfied because they thought that more emphasis should be given to ideas. It is obvious that a much higher proportion of Monday teachers were dissatisfied as compared with the Saturday group.

Testing Proportions of Satisfied and Dissatisfied Teachers.

Discrepancy scores were calculated for all ten items on the PMRS, for all administrations, and for both groups. Later in this chapter, graphs of these average scores are presented for interpretation. At the moment, seven of the ten items judged by the research staff to be most important aspects of the training situation will be analyzed. These seven items are concerned with: the role of the instructor, whether the teachers did or did not feel free to participate, whether the sessions were too formal or informal, and whether what was learned was thought to be practical or impractical.

The procedure used to calculate a discrepancy score was to average discrepancies during the first four weeks, during the second five weeks, and then for the total program. An average which fell within the range +0.499 and -0.499 was classified as "satisfied". All other average scores were classified as "dissatisfied". The direction of the dissatisfaction was determined by the positive or negative sign. It should be remembered that the discrepancy score is theoretically independent of the teacher's perception. What a teacher prefers may or may not be what is perceived; satisfaction or dissatisfaction may occur with any perception.

The Role of the Instructor:—A cluster of items 2, 5, 7, and 9 were combined to form a single score based on positively intercorrelated items. These items were concerned with whether control, participation, ideas discussed and progress were due more to the instructor or to the teachers. Based on the limits described above, the proportions of satisfied and dissatisfied teachers are shown in Table 4.7.1. Chi-square calculations show significant differences between the proportion of satisfied teachers in the Saturday and Monday groups: for the first four weeks $X^2 = 8.82$, for the second five weeks $X^2 = 14.57$ and for the

Table 4.7.1

THE FREQUENCY OF SATISFIED AND DISSATISFIED DIRECT AND INDIRECT TEACHERS IN THE INSERVICE TRAINING PROGRAMS

Instructor Cluster (Items 2, 5, 7, and 9)

Inservice Program—>		Saturday Indirect		Monday Direct	
Initial Teaching Style—>		Indirect N = 10	Direct N = 15	Indirect N = 16	Direct N = 10
1st Four Weeks	Dissatisfied-Wanted more direct	0	0	0	2
	Satisfied	7	12	6	3
	Dissatisfied-Wanted more indirect	3	3	10	5
2nd Five Weeks	Dissatisfied-Wanted more direct	0	0	3	4
	Satisfied	7	10	4	0
	Dissatisfied-Wanted more indirect	3	5	9	6
All Nine Weeks	Dissatisfied-Wanted more direct	0	0	1	2
	Satisfied	7	12	5	2
	Dissatisfied-Wanted more indirect	3	3	10	6

entire program $X^2 = 12.28$. When the same proportions were tested for indirect teachers only, the first four weeks were not significantly different, the second five weeks scores were barely significant ($X^2 = 5.11$) and the entire program differences could have occurred by chance about 6 out of 100 times ($X^2 = 3.72$). For the direct teachers, the same proportions are all significant. In every case there was more satisfaction in the Saturday group.

During the second five weeks in the Monday group, seven out of 26 teachers would have preferred a more direct instructor role; 15 out of 26 would have preferred a less direct instructor role; and only four out of 26 were satisfied with the instructor's role. In the Saturday group, no teacher would have preferred a more direct instructor role.

One can conclude from the data in Table 4.7.1 that more teachers, both initially direct and indirect, were satisfied with the instructor's role in the Saturday group. In addition, there was less agreement among the Monday dissatisfied teachers concerning how the instructor's role should be changed, compared with the Saturday teachers who were also dissatisfied. In general, dissatisfaction occurred because the instructor was too directive.

Freedom of Participation:—Item eight concerned perceived freedom of teacher participation. The average discrepancy scores were calculated as previously described. Table 4.7.2 indicates the proportion of teachers who were satisfied or dissatisfied with this aspect of the training sessions.

A Chi-Square analysis indicated that the proportions of satisfied teachers in the Saturday and Monday groups were not significantly different during the first four weeks, but were significant during the second five weeks ($X^2 = 4.25$) and for the entire program ($X^2 = 5.38$). More teachers were satisfied with the degree of perceived freedom in the Saturday group. Both indirect and direct teachers contributed about equally to this significant trend.

Theoretical Versus Practical:—Satisfaction and dissatisfaction with whether the content covered was practical or theoretical was the

Table 4.7.2

THE FREQUENCY OF SATISFIED AND DISSATISFIED DIRECT AND INDIRECT TEACHERS IN THE INSERVICE TRAINING PROGRAMS

Freedom of Participation (Item #8)

Inservice Program—>		Saturday Indirect		Monday Direct	
Initial Teaching Style—>		Indirect N = 10	Direct N = 15	Indirect N = 16	Direct N = 10
1st Four Weeks	Dissatisfied-Wanted less freedom	1	0	0	1
	Satisfied	7	10	11	7
	Dissatisfied-Wanted more freedom	2	5	5	2
2nd Five Weeks	Dissatisfied-Wanted less freedom	1	1	2	1
	Satisfied	9	12	9	6
	Dissatisfied-Wanted more freedom	0	2	5	3
All Nine Weeks	Dissatisfied-Wanted less freedom	1	1	2	1
	Satisfied	9	12	8	6
	Dissatisfied-Wanted more freedom	0	2	6	3

Table 4.7.3

THE FREQUENCY OF SATISFIED AND DISSATISFIED DIRECT AND INDIRECT TEACHERS IN THE INSERVICE TRAINING PROGRAMS

Theoretical Versus Practical (Item 1)

Inservice Program—>		Saturday Indirect		Monday Direct	
Initial Teaching Style—>		Indirect N = 10	Direct N = 15	Indirect N = 16	Direct N = 10
1st Four Weeks	Dissatisfied- Wanted more theoretical	0	3	2	1
	Satisfied	8	8	8	1
	Dissatisfied- Wanted more practical	2	4	6	8
2nd Five Weeks	Dissatisfied- Wanted more theoretical	0	1	1	1
	Satisfied	6	10	2	1
	Dissatisfied- Wanted more practical	4	4	13	8
All Nine Weeks	Dissatisfied- Wanted more theoretical	0	0	0	1
	Satisfied	6	13	4	2
	Dissatisfied- Wanted more practical	4	2	12	7

central issue of item one. Table 4.7.3 shows the proportions of satisfied teachers in the Monday and Saturday groups.

A Chi-square analysis of the proportions of satisfied teachers in the two groups for the first four weeks indicates a significant difference ($X^2 = 4.40$), the same proportions are also significant for the second five weeks ($X^2 = 15.00$) and for the entire program ($X^2 = 14.28$). The greater satisfaction is again associated with the Saturday group.

Dissatisfaction between the balance of theoretical and practical emphasis became most marked in the Monday group during the last five weeks of the program. The majority of teachers would have preferred a more practical emphasis, even though they were supposed to be directing their own activities during the latter stages of the training program. Differences between the initially indirect and direct teachers appear to be less marked than the differences between the two training programs.

Formal Versus Informal:—Item six was concerned with whether the training program was too formal or too informal. The proportions of satisfied and dissatisfied teachers with this aspect of the training are shown in Table 4.7.4.

For the most part the different proportions of satisfied teachers in the Saturday and Monday groups could have occurred by chance. The Chi-square test of the entire program, $X^2 = 3.92$ barely reaches the 0.05 level of significance. The trend is toward higher satisfaction within the Saturday group.

During the second five week period, the dissatisfied teachers did not agree concerning how this aspect of the training program should be changed. Some would have preferred more formality, others more informality.

Summary:—These tests of the proportions of teachers who were satisfied or dissatisfied with various aspects of the training program indicate that dissatisfaction was higher in the Monday group and satisfaction was higher in the Saturday group. For the most part these

Table 4.7.4

THE FREQUENCY OF SATISFIED AND DISSATISFIED DIRECT AND INDIRECT TEACHERS IN THE INSERVICE TRAINING PROGRAMS

Formality Versus Informality (Item 6)

Inservice Program-->		Saturday Indirect		Monday Direct	
Initial Teaching Style-->		Indirect N = 10	Direct N = 15	Indirect N = 16	Direct N = 10
1st Four Weeks	Dissatisfied-Wanted more formal	2	0	1	1
	Satisfied	5	14	11	5
	Dissatisfied-Wanted more informal	3	1	4	4
2nd Five Weeks	Dissatisfied-Wanted more formal	2	0	3	3
	Satisfied	7	13	9	6
	Dissatisfied-Wanted more informal	1	2	4	1
All Nine Weeks	Dissatisfied-Wanted more formal	2	0	4	2
	Satisfied	7	13	9	5
	Dissatisfied-Wanted more informal	1	2	3	3

differences were statistically significant and could not have occurred by chance, particularly during the second five week period. Just how these significant differences developed will be shown in the next section.

Changes in Satisfaction During the Learning, Work, and Evaluation Periods.

In order to interpret different perceptions and degrees of satisfaction during the nine week inservice training programs, we must review the three major periods into which the training was divided.

During the first four weeks, the training consisted primarily of introducing new concepts about teacher influence, such as indirect and direct influence, dependence and independence, clear and ambiguous goals; and in learning the observation procedures of interaction analysis including the tabulation of matrices. This first period was called the "learning period".

The second period of three weeks was called the "work period". During the work period there were two, two-hour meetings devoted primarily to reports by teachers of experiments or observation projects which they had carried out in their own rooms either as individuals alone, as individuals with the help of a staff observer, or as members of a teacher team.

The last two weeks were called the "evaluation period" in which two four-hour meetings were held to discuss the entire inservice training program. Two hours of the last four-hour meeting were devoted to taking tests or making recordings of evaluation discussions.

Three PMRS were administered during the four-week learning period; these occurred at the second, third, and fourth meetings. During the three-week work period, there were two meetings each ending with a PMRS. During the two-week evaluation period, a PMRS was administered at the end of each of the two four-hour meetings.

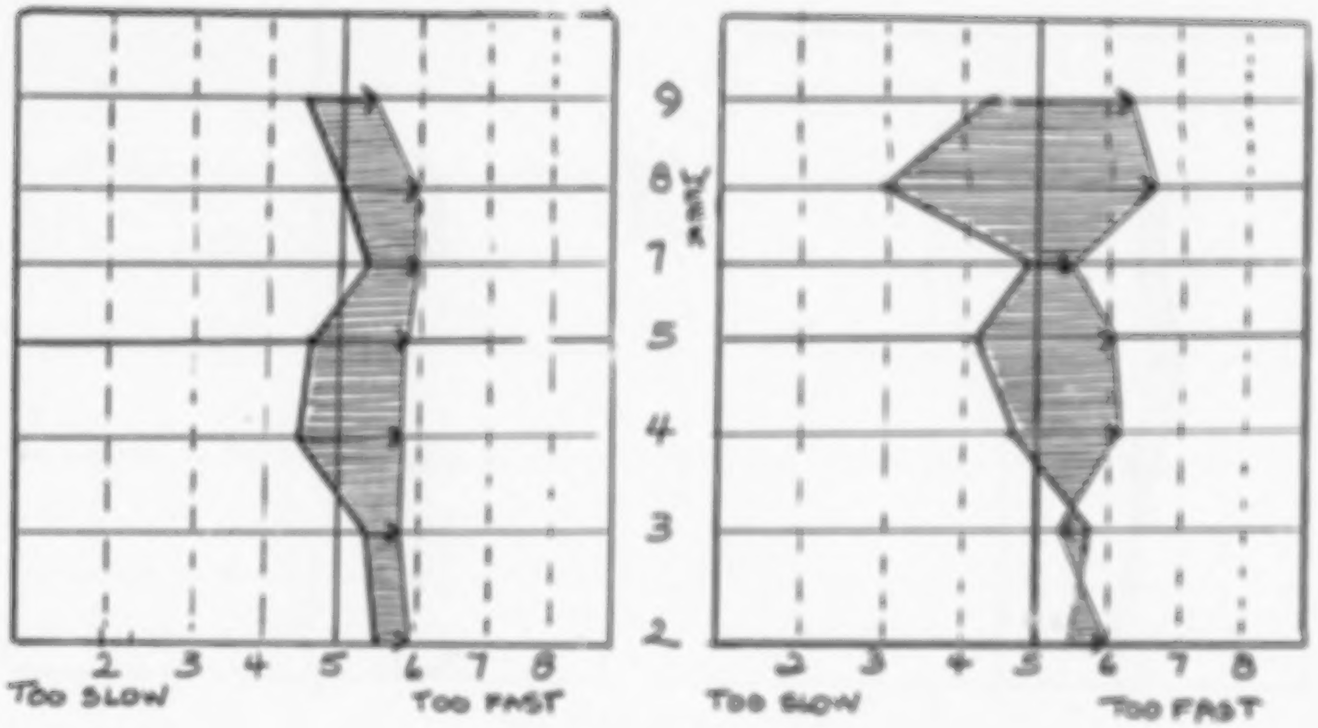
Why was the Saturday Program Superior?—The question, "Why", requires an explanation. There are several possible explanations, but the proposals that follow seem the most appropriate to the research staff.

Figures 4.4 and 4.5 are a plot of the average perceptions and preferences of the teachers in the Saturday and Monday groups, along a time line representing the seven administrations of the PMRS, with regard to whether the material was presented too fast or too slow, and whether it was too difficult or too easy. These are perceptions related to the rigor of the intellectual activities.

The inference we choose to make from these graphs is that the more the teachers were placed "on their own" and were forced to rely on their own resources for whatever progress was made, the Monday group became more dissatisfied when compared with the Saturday group. This trend is clearly evident except for the seventh week, a week which must be ignored because the regular instructor was out of town and a substitute staff member was in charge. Notice that the Monday dissatisfaction is highest during the eighth week, a meeting at which teachers were encouraged to discuss what they had gained from participating in the inservice training. Differences are very small between the Monday and Saturday groups with respect to dissatisfaction during the first three weeks of the more formal learning sessions. Dissatisfaction is on the increase with the meeting in the fourth week in which plans for self-experimentation and observation projects were proposed, and extends into the work period in which self-direction was essential to progress.

If we can associate too slow and too easy with lack of rigor in the intellectual challenge and the reverse with the presence of rigor, then the Monday group became more dissatisfied with the intellectual challenge the more they were placed on their own resources. A similar, but much smaller dissatisfaction, appeared in the Saturday group when these teachers were placed on their own resources.

Next we turn to Figures 4.6 and 4.7 which deal with the formal and informal aspects of the inservice training and also with whether teachers felt free or not free to express their own ideas or attitudes. The major features of these graphs are that Saturday scores are consistently lower than Monday scores, which show that they perceived greater informality,



EVALUATION SCORES

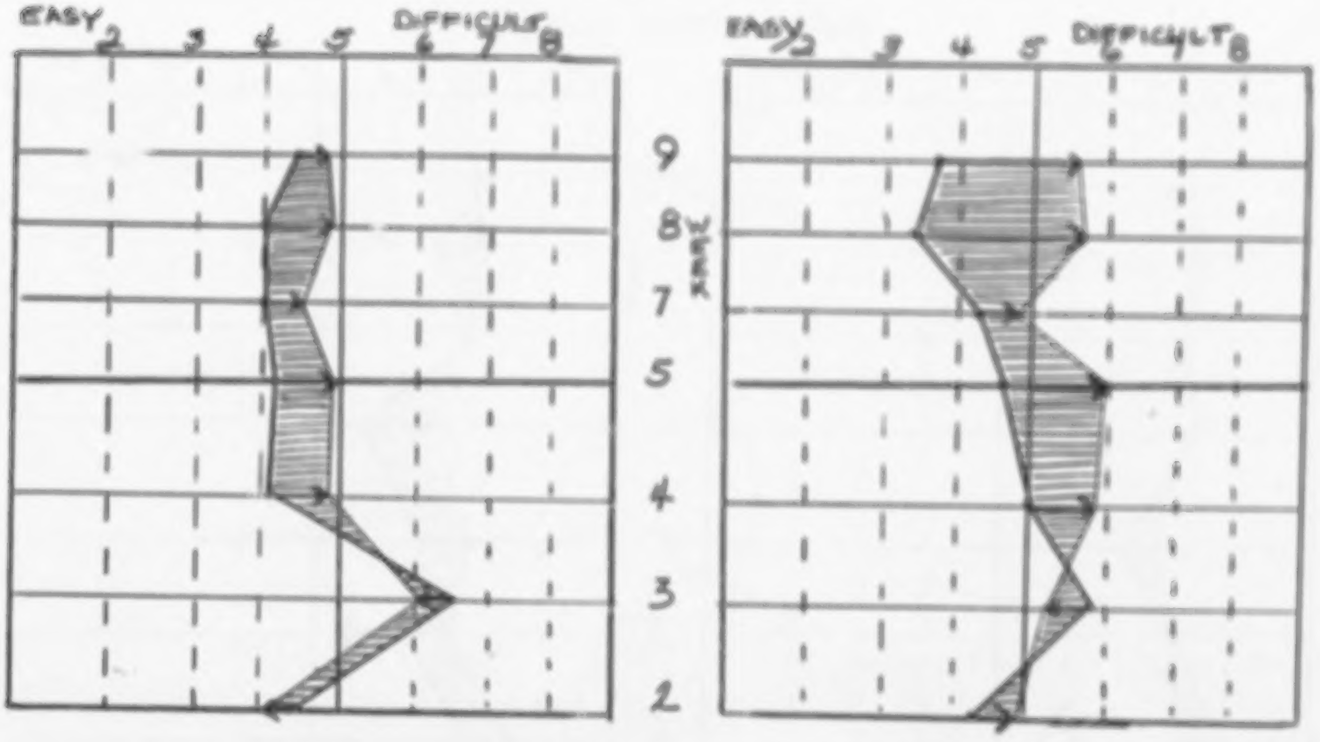
SATURDAY MONDAY

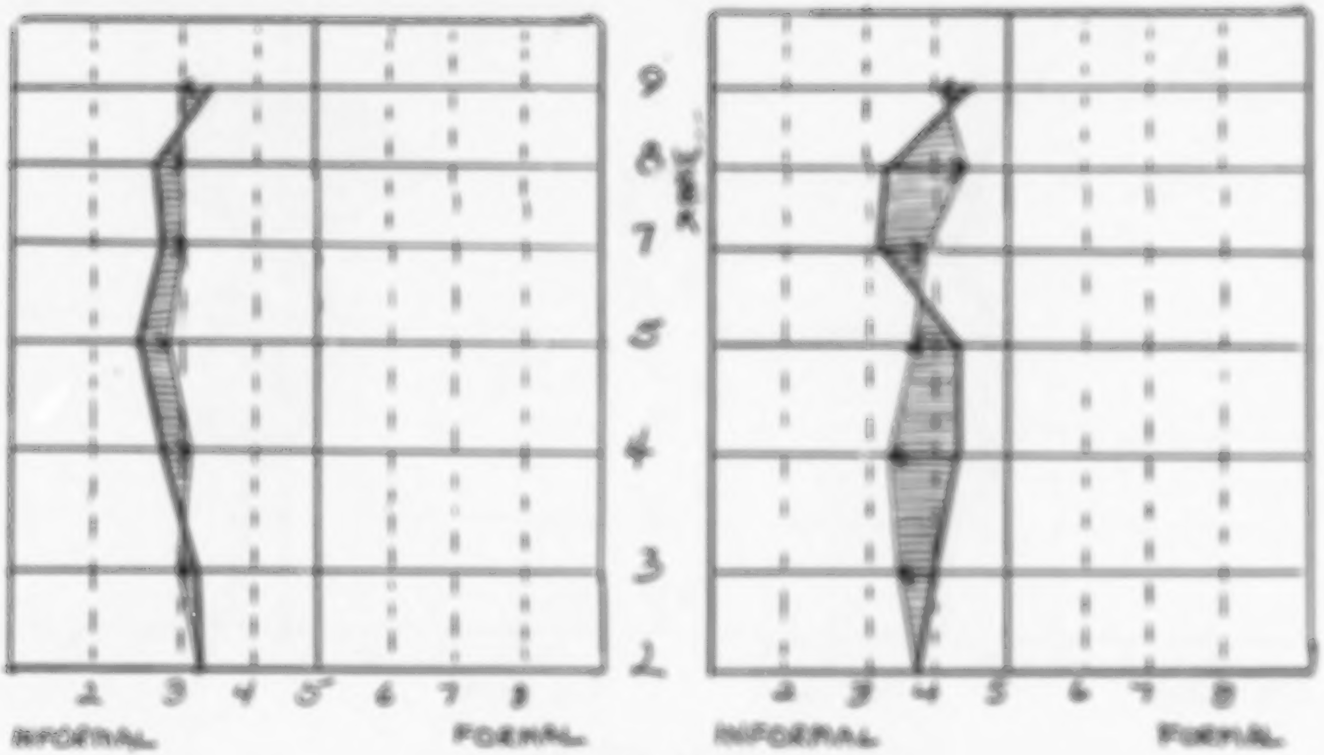
FIGURE 4:4

FIGURE 4:5

SATURDAY MONDAY

EVALUATION SCORES





EVALUATION SCORES

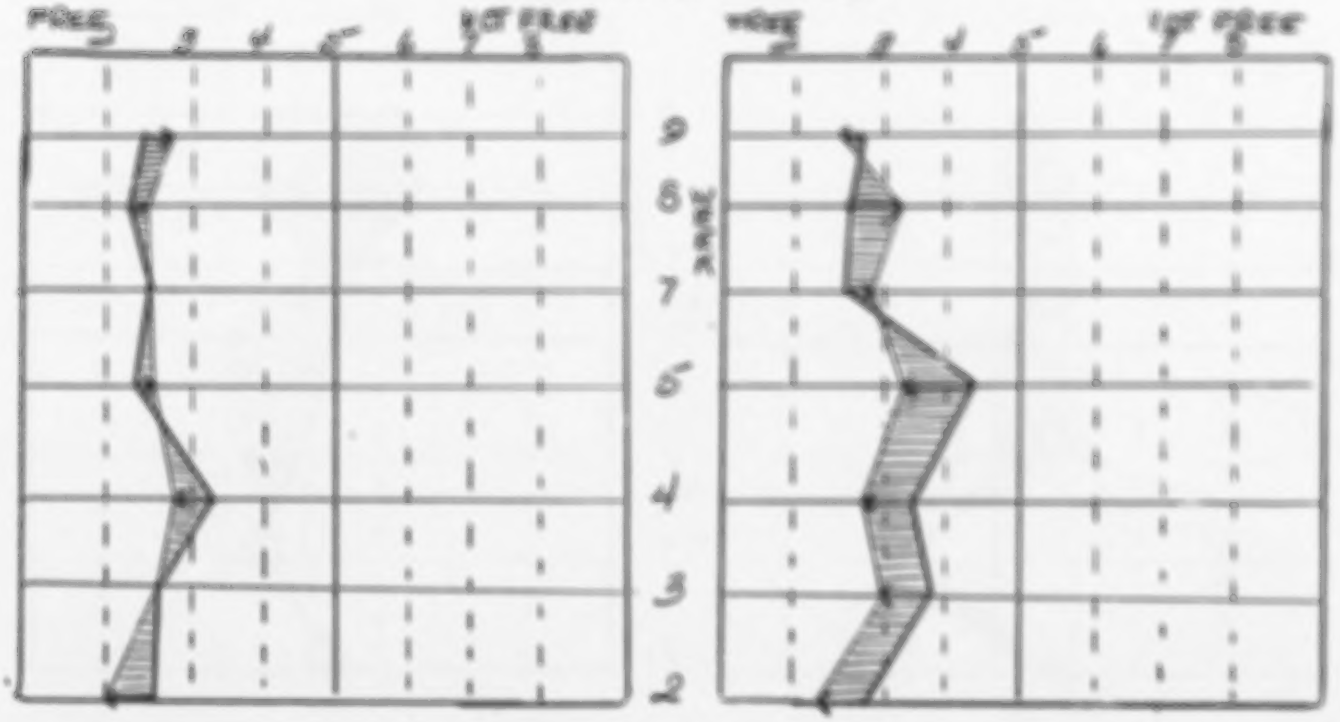
SATURDAY MONDAY

FIGURE 4:6

FIGURE 4:7

SATURDAY MONDAY

EVALUATION SCORES



more freedom, and less dissatisfaction than did the Monday group.

Our inference is that the Saturday teachers perceived the instructor's role and the opportunities for teacher participation as relatively consistent with the learning objectives. This consistency was not present in the Monday group which at first wanted less formality, but ended up preferring more formality and less freedom during the seventh and eighth weeks, or in other words, they tended to reject the freedom and informality which had begun to develop.

Figures 4.8 and 4.9 plot data with regard to whether ideas or attitudes were emphasized and whether the content was theoretical or practical, the latter being a rather unfortunate dichotomy. Again the major feature is one of growing dissatisfaction in the Monday group, with the exception of the meeting held in the seventh week with the substitute instructor.

The inference we choose to make is that the Saturday group was able to integrate the emotional and ideational aspects of changing teacher behavior, particularly with respect to practical applications in the classroom. Dissatisfaction is uniformly low in the Saturday group for these two dimensions, particularly before the evaluation activities. The lack of a bridge between what was studied and practical classroom problems is particularly interesting at the third week when matrix tabulation and interpretation were discussed. At this meeting both groups saw the activity as more difficult and more ideational, but this was much more practical for the Saturday teachers and not practical enough for the Monday teachers. Incidentally, the activities of the third week sessions were almost identical in the Monday and Saturday meetings, since they involved tabulating matrices and attempts to interpret them. The Monday group simply didn't see the same values in these activities.

Next, we turn to Figures 4.10 - 4.13, which deal with various perceptions of the instructor's behavior and influence. The most dramatic differences occur in Figures 4.10 and 4.11 which refer to whether activities were controlled by the instructor or the teachers and whether the ideas discussed came from the instructor or the teachers.

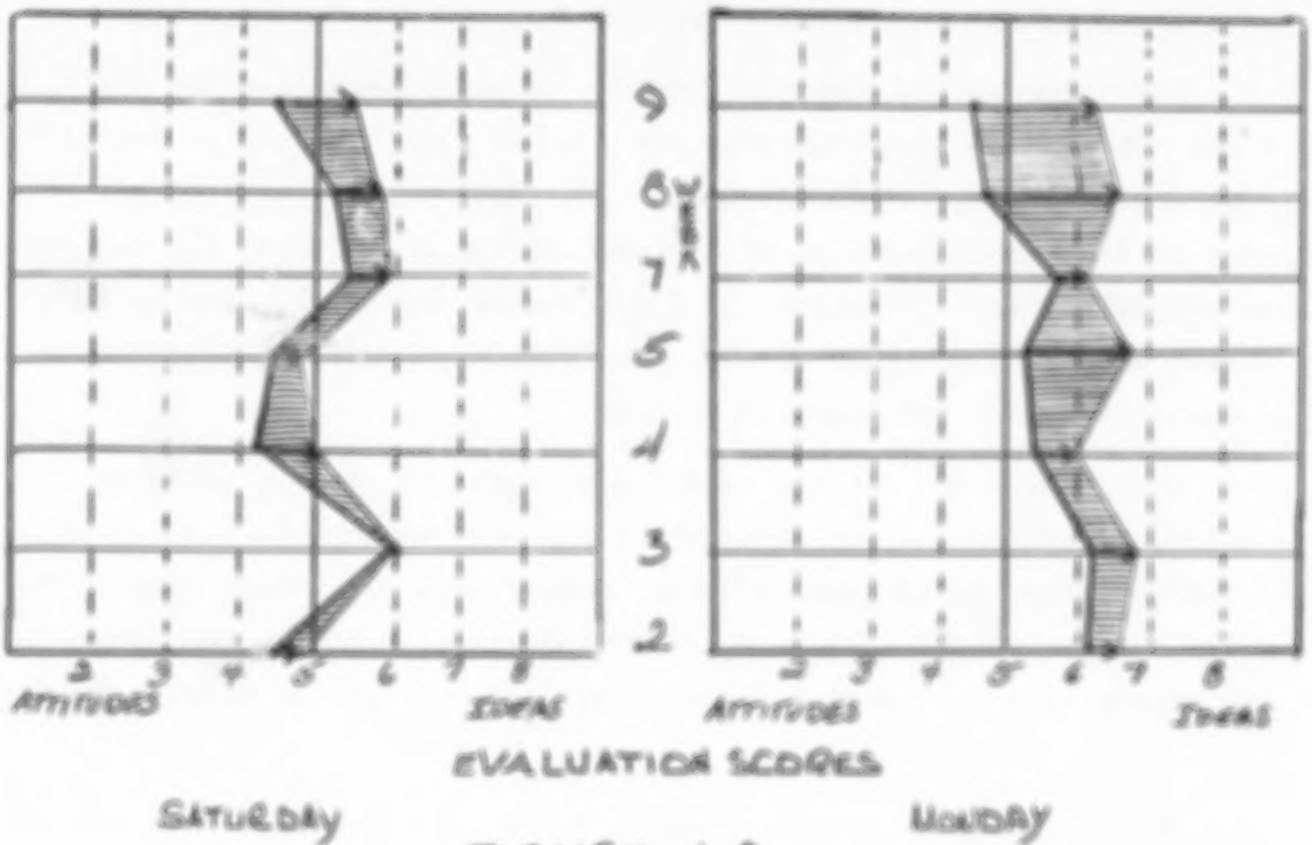
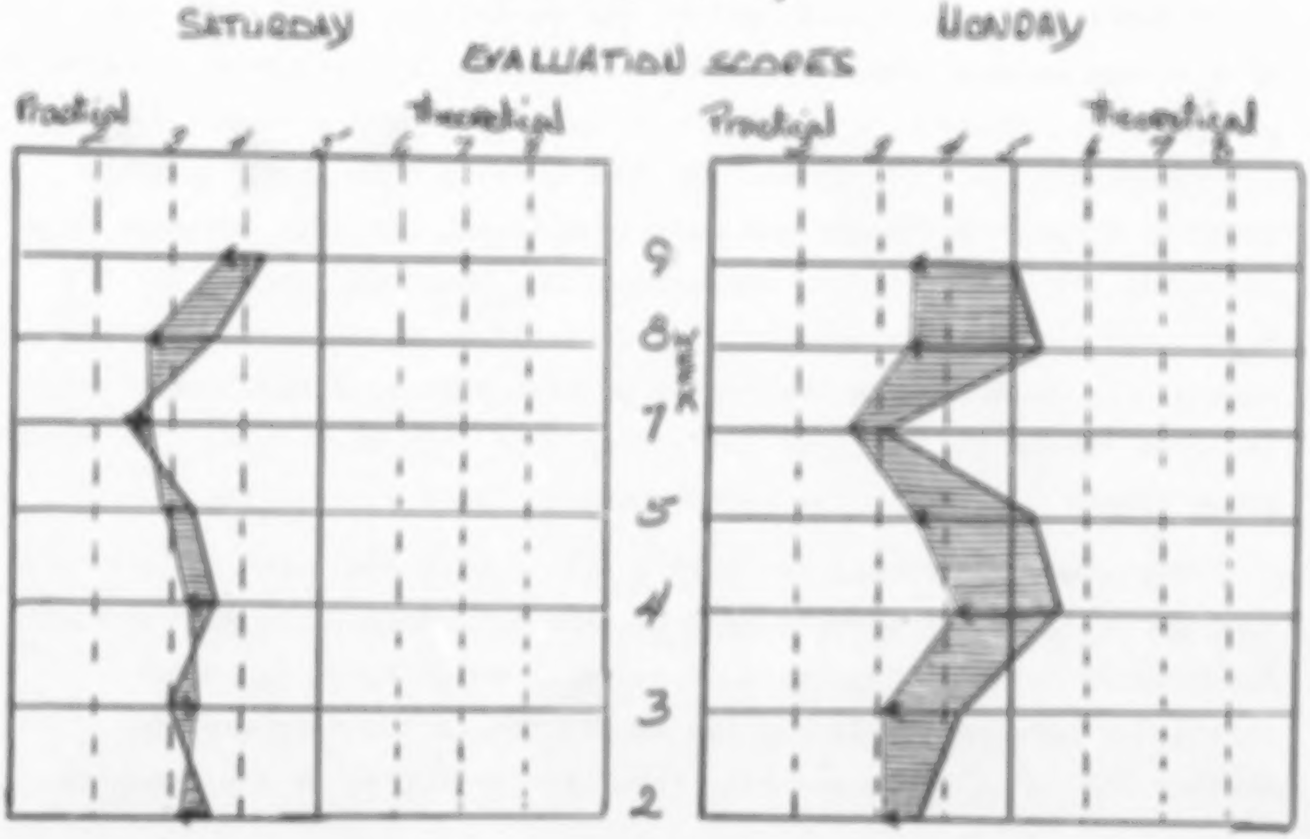


FIGURE 4:8

FIGURE 4:9



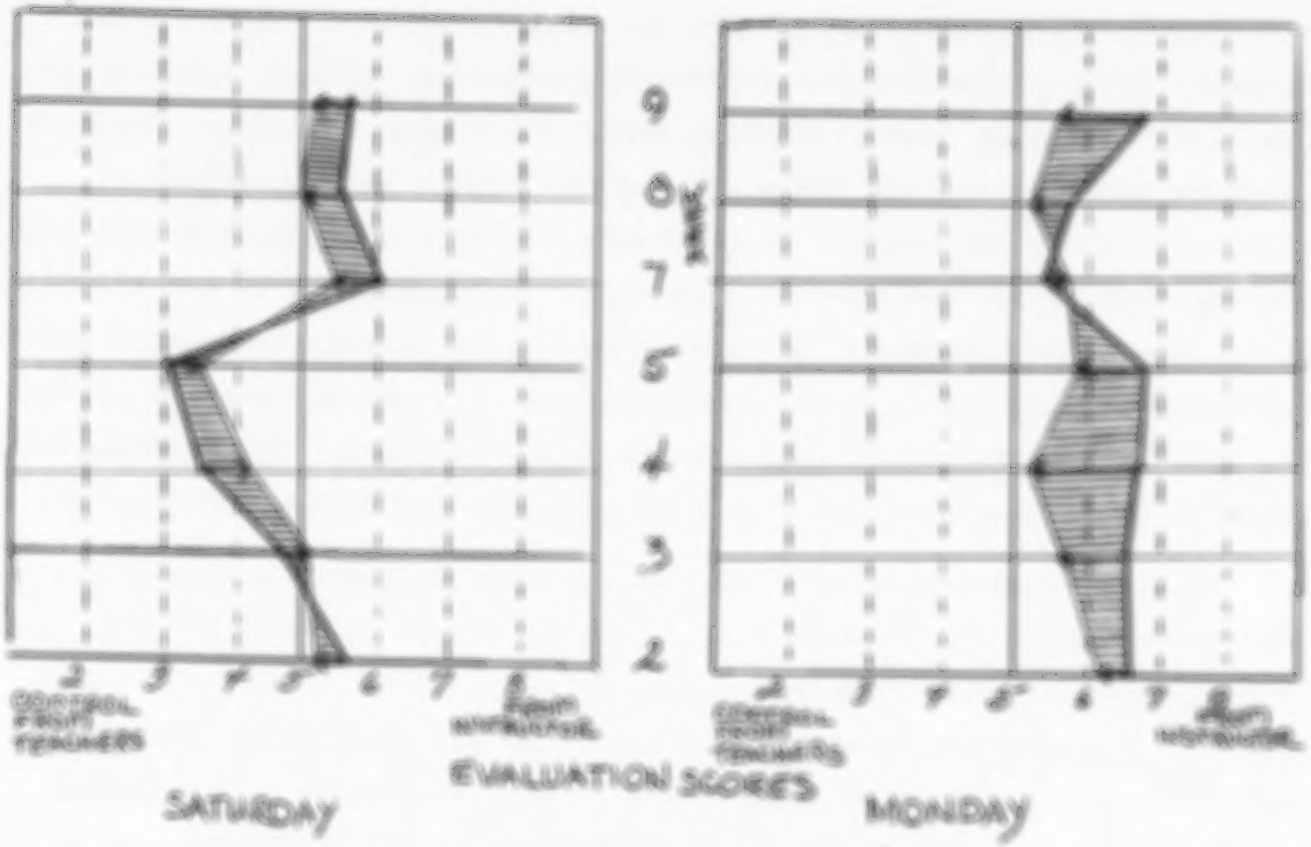
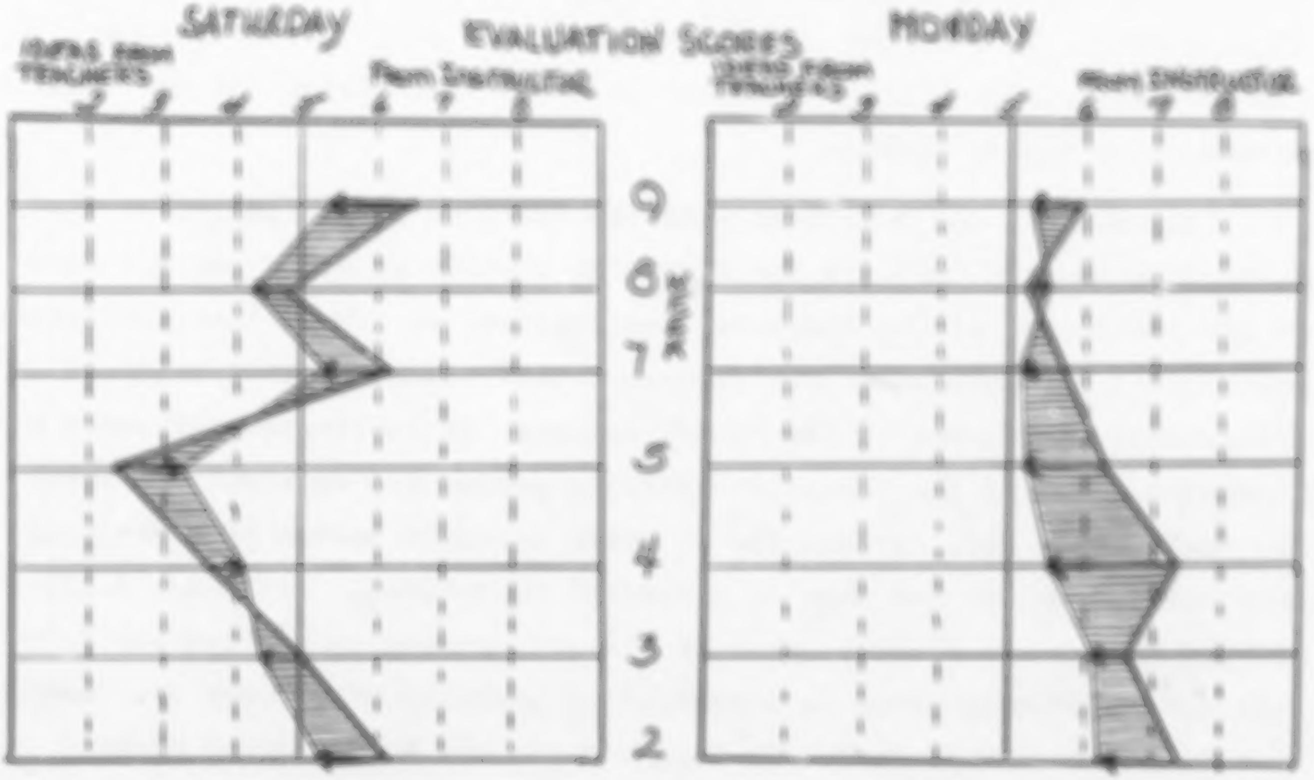


FIGURE 4:10

FIGURE 4:11



Undoubtedly, the greater acceptance and clarification of ideas in the Saturday group produced these different perceptions of what occurred and explains the higher dissatisfaction among the Monday teachers. Saturday teachers saw the ideas as their own and the control of activities as clearly in their own hands. These trends increase consistently with each meeting, except for the seventh week which was supervised by the substitute instructor. The evaluation activities were more closely controlled by the instructor during the last two sessions, but this was not a point of dissatisfaction, particularly among the Saturday teachers. The maximum differences occur when self-direction was required during the work period.

It is interesting to note how the accident of having a substitute instructor during the seventh week, near the end of the work period, presents unusual evidence concerning the influence of the instructor on the teachers' perceptions of self-direction. The Saturday group suddenly shifted from a position of perceived high self-direction to a position of instructor control not much different from the Monday group. It is clear that the substitute did not maintain the required role differences in the Monday and Saturday sessions. This shift, as well as the average perceptions during the evaluation period, provides ample evidence of the sensitivity of the perception scales. Evidence of validity is shown by these changes, by the rise in scores during the last two evaluation sessions and early, initial sessions in which staff direction was clearly present to a higher degree.

Figures 4.12 and 4.13 deal with the relative participation of the instructor and the teachers and also with whether progress was due more to the instructor or the teachers' own initiative. These last two graphs provide, in the opinion of the research staff, fairly direct evidence of the greater dependence of the Monday teachers on instructor influence and direction. During the formative learning period and continuing through the work period application, the Saturday teachers became progressively more self-directive and they so perceived themselves. In Figure 4.12, the two groups are clearly aware of the differences in the instructor's role and the Monday group is dissatisfied probably with their own inability to take a more active part. In Figure 4.13, the Monday group clearly

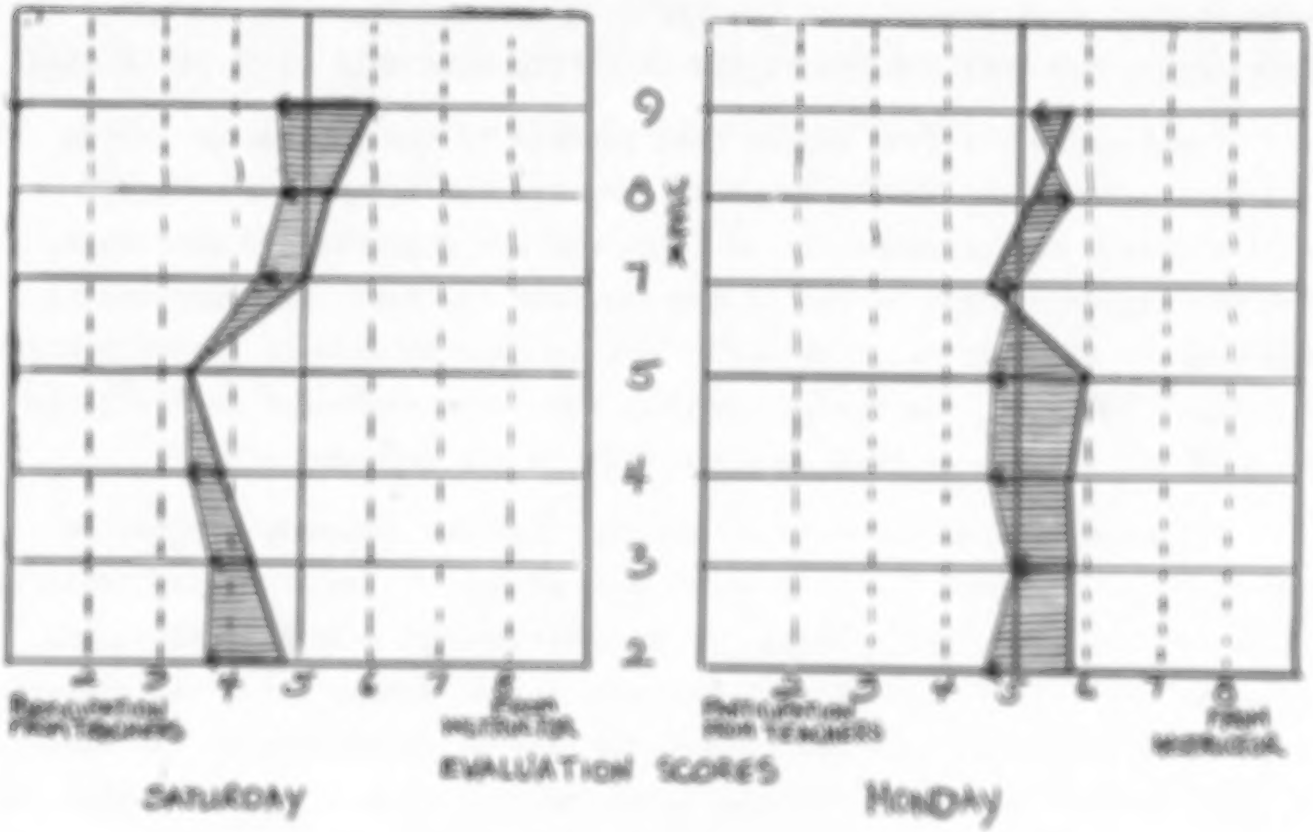
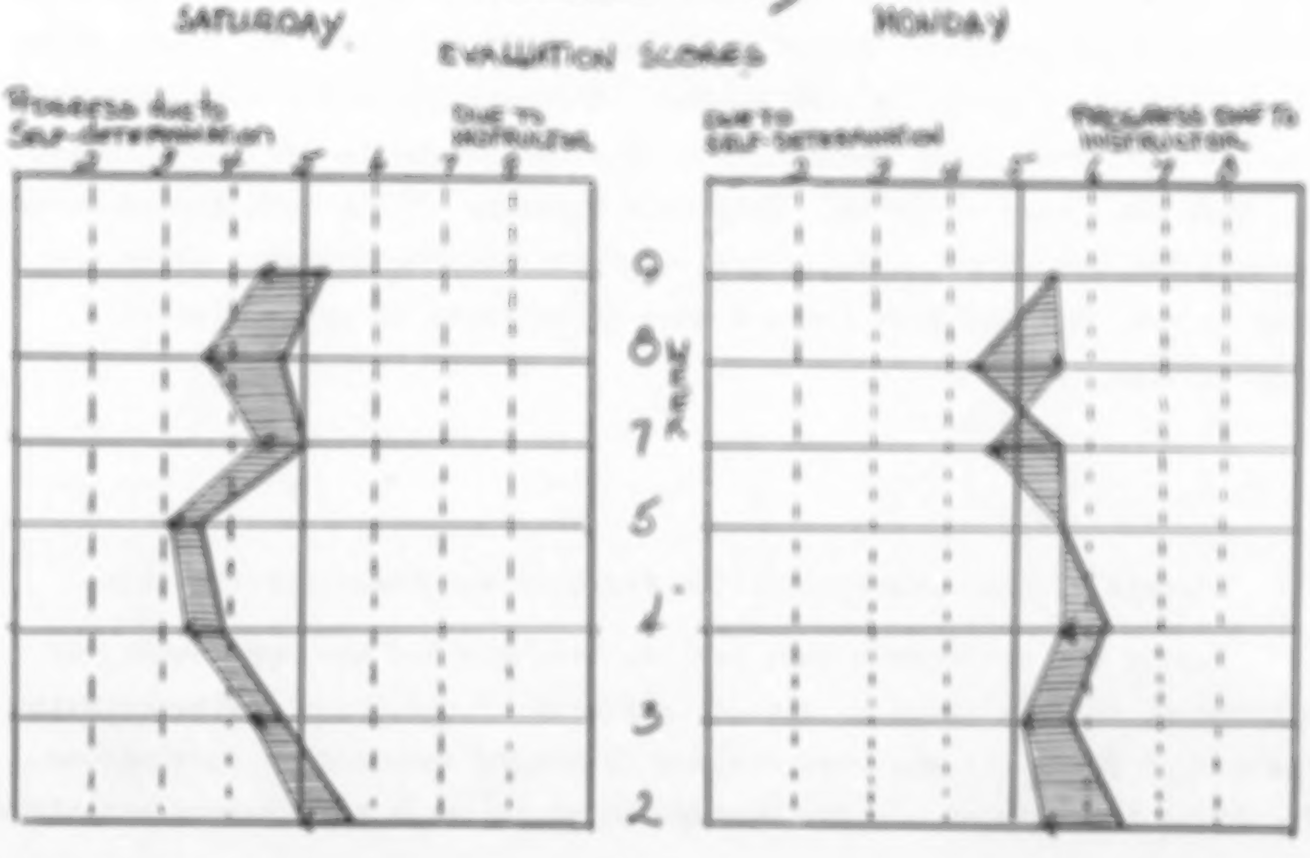


FIGURE 4:12

FIGURE 4:13



acknowledges that progress in the training is more dependent on the instructor, BUT THEY ARE RELATIVELY SATISFIED WITH THIS STATE OF AFFAIRS.

Considering all four graphs that pertain to the instructor during the work period, the Monday teachers perceive the instructor's higher participation and presentation of ideas and are dissatisfied with this. Yet the higher control of the instructor, and the fact that progress is due more to him than to self-initiative, produce relatively less dissatisfaction. In short, the Monday teachers were more dependent on the influence of the instructor than were teachers in the Saturday group.

To summarize the question of why the indirect Saturday program is superior, it is clear that teachers' perceptions of the inservice training situation and their satisfaction or dissatisfaction with this situation provides one fairly logical explanation. In the Monday group the instructor's more directive role maintained the initial dependence of the teachers on him, so that when self-directed experimentation was required during the work period, the Monday teachers were not prepared. During the work period, they wanted to be more self-directive, but were less successful in their self-directed experimentation. The teachers in the Saturday group perceived themselves as becoming more self-directive with each of the first four sessions so that they were better prepared to direct their own activities during the work period. They established a more balanced concern for ideas about teaching and their attitudes toward these ideas, and they were more satisfied with this balance. While both groups covered essentially the same inservice training content, the Saturday group was able to use what had been learned more effectively in self-directed applications.

Reports of Self-Experimentation Projects and Class Observations

During the three-week work period, teachers had the opportunity of attempting to make changes in their patterns of classroom influence with the aid of observers who were trained to record spontaneous interaction. To obtain the help of a staff member who could serve as observer-consultant, a teacher was required to initiate a phone request. In the event that one teacher worked with another, they had to initiate their own plans.

Four working teams of teachers were created; one four-man team, a three-man team, and two two-man teams. All of the teachers who participated on these teams were in the Saturday group except one teacher who was in the Monday group. These teams conducted several experiments which included trying out a particular approach to a teaching situation, observing, making tape recordings, tabulating the matrices, and reporting their results during the inservice training sessions. The exact number of hours spent in these activities is not known, but it was obviously in excess of thirty man-hours.

In addition to the team activities, teachers in both groups contacted the office to arrange for staff consultant-observer visits. In the Saturday group, 21 observations were requested by 15 teachers, and 19 of these requests were completed. Two observations were not completed because a staff observer could not be scheduled. In the Monday group, 13 observations were requested by 12 teachers, and 11 observations were completed. Again, two were not completed because of scheduling difficulties.

There was a clear superiority of man-hours of experimentation in the Saturday and Monday groups. It was the subjective opinion of the staff that there were more unreported hours within the Saturday group, compared with the Monday group. A partial check of this opinion is possible by reporting the results of four items in the PMRS. Teachers were asked to rate the amount of time (a) they spent with fellow teachers discussing the inservice training program, (b) time spent in classroom experimentation based on the inservice training, (c) work accomplished with staff consultant-observers, and (d) time spent in outside reading. The average ratings on these four items combined is shown in Table 4.8.

Teachers in the Saturday group reported a slightly higher average than those in the Monday group for the first four weeks, but this difference was not statistically significant. Differences for the second five weeks, and those averaged over the entire program, were statistically significant. The Saturday group showed the higher averages. The data

Table 4.8

REPORTED ACTIVITIES OUTSIDE OF THE REGULAR
INSERVICE TRAINING SESSIONS

Group	Combined Mean Evaluations(a)		
	First Four Weeks	Second Five Weeks	Entire Program
Saturday	13.63	18.21	16.21
Monday	11.97	16.11	14.30
K.S. Test 2 d.f.	$\chi^2 = 2.96$ N.S.	$\chi^2 = 6.09$ $< .05 > .02$	$\chi^2 = 9.22$ $< .01 > .001$

(a) Average score on four items in the PMRS:

(1) Discussions with fellow teachers about inservice during the week.
(2) Classroom experimentation based on the program.
(3) Work with staff consultant observers.
(4) Reading materials or books.

in Table 4.8, which are unverified estimates by teachers, are consistent with the more accurate records kept by members of the staff.

By way of summary, it is sufficient to say that the Saturday teachers were able to generate more man-hours of work than the Monday teachers in connection with the inservice training program, particularly self-directed work during the three-week work period.

Satisfaction and Dissatisfaction with the Instructor and Change in the I/D Ratio

We now turn to Hypothesis E, page 31, which predicts that teachers who show the most gain in indirect teaching behavior will be the most satisfied with the inservice training program.

The basic data pertaining to this hypothesis have already been shown in Table 4.7.1-4 and then discussed in considerable detail following the table. It is quite clear that given a single, rather narrow standard of satisfaction (plus or minus 0.499), the proportion of satisfied teachers was much higher in the Saturday group, compared with Monday, and gain in I/D is also higher in the Saturday group. These statistically significant differences are true of both initially indirect and direct teachers during the second five-week period and for scores based on the entire program. During the first four weeks, the initially indirect teachers in the Monday and Saturday groups were about equally satisfied, while the initially direct were more satisfied in the Saturday program.

These statistically significant differences are largest for the second five weeks of the training period. During this part of the program a test of satisfaction makes the most sense, because during this latter half of the program teachers were trying to apply what they had learned in their own classrooms and were evaluating how much they had learned. The data in Table 4.7.1-4 provide unequivocal support for Hypothesis E.

However, additional understanding of the dynamics of satisfaction and dissatisfaction can be obtained by analyzing the relative satisfaction within each of the two training groups. To follow this additional analysis several assumptions must be made. First, suppose we restrict our interest to satisfaction or dissatisfaction with the cluster of four items that refer to teacher versus instructor dominance. Second, since so few teachers were satisfied with this aspect of the training in the Monday group, we will have to increase the number of satisfied teachers in this group by expanding the limits of a satisfied perception from plus or minus 0.499 to plus or minus 0.749. This latter number will provide us with 14 relatively satisfied teachers in the Monday group and, by retaining the original, narrow margin in the Saturday group, there will be 14 satisfied teachers in that group also. Our final assumption concerns who is at fault when a teacher is dissatisfied. All dissatisfied teachers except two, in the data about to be considered, wanted more teacher dominance rather than more instructor dominance. It is possible to assume that in the Saturday group the cause of this dissatisfaction would be shared equally by the instructor and the teachers, while in the Monday group, teachers would more likely blame the instructor. If this assumption is accepted, then the meaning of dissatisfaction is somewhat different in the two groups.

The data on relative satisfaction within the two groups and the three outcome variables is shown in Table 4.9. All comparisons that are statistically significant at the 0.05 level, or nearly so, are indicated by brackets. Most of the inferences to be made, however, will be based on trends rather than the bracketed, statistically significant differences. Since Hypothesis E has been supported by the data in Table 4.7.1-4 the present discussion is concerned with speculations about the nature of satisfaction and dissatisfaction.

One fairly safe inference is that much of the positive change in I/D, i/d and flexibility in the Saturday group can be associated with teachers who are dissatisfied because they would prefer more teacher influence. These same differences are not only smaller in the Monday group, but in each case the trend is reversed. Our preferred interpretation of these trends is that in a training situation in which teachers perceive themselves as having a share in the direction of activities, the desire to have even more teacher direction is characteristic of teachers who are making progress in training. This is not true of the Monday group in which the instructor is seen as having greater influence. On the contrary, a weak trend indicates that teachers who are more satisfied may be making the most progress.

Summary of the Results

The major conclusion of these results is that the Saturday, more indirect, training program was superior to the Monday, more direct, program. The Saturday teachers were able to apply what they had learned in the training program by conducting self-directed experimentation in their classrooms more often. An analysis of the development of teacher

Table 4.9

MEAN CHANGE IN I/D, i/d AND FLEXIBILITY FOR RELATIVE SATISFACTION AND DISSATISFACTION OF INSTRUCTOR VERSUS TEACHER DOMINANCE

Group	Teachers' Perception (a)	I/D		i/d		Flexibility	
		N	Mean Change	N	Mean Change	N	Mean Change
Saturday	Satisfied	14	+ .049	14	+ .520 [c]	10	- .022 [d]
	Dissatisfied Wanted More Teacher Influence	11	+ .116 [b]	9	+2.361 [c]	8	+1.012 [d] [e]
Monday	Dissatisfied Wanted more Instructor Influence	2	+ .024	2	+1.561	2	- .239
	Satisfied	14	+ .001	12	+1.883	12	+ .221
	Dissatisfied Wanted more Teacher Influence	10	- .006 [b]	10	+1.192	10	+ .090 [e]

(a) Based on four item cluster referring to whether "ideas discussed", "control", "participation" or "progress" were associated with the instructor or with the teachers. Satisfied for Saturday = +.499 to -.499; Satisfied for Monday = +.749 to -.749. Averages were based on entire program.

(b) K. S. $X^2 = 5.43$, near 0.05 (0.05, $X^2 = 5.99$)

(c) K. S. $X^2 = 6.00$, significant at 0.05

(d) K. S. $X^2 = 8.72$, significant at 0.02

(e) Significant at 0.05 by Fisher Exact Test perceptions during the nine-week program suggested that the more indirect instructor role fostered a greater sense of independence, a more equal balance between attitudes toward teaching and ideas about teaching, and the ability to maintain the balance of satisfaction-dissatisfaction during the shift from early learning period to the middle work period of classroom application. The more direct instructor role fostered more dependence on the instructor, dissatisfaction with the attention given to attitudes and an increasing dissatisfaction during the shift from the early learning period to the middle work period of classroom application.

An analysis of the compatibility hypotheses showed that the initially indirect teachers were more sensitive to the direct and indirect aspects of the instructor's influence to the extent that they made the least progress in the application of social skills in the classroom when exposed to a more directive instructor. Initially direct teachers, who were less sensitive to differences in the instructor's role, made approximately equal progress in the two training programs.

While progress or lack of progress was different for the two training programs, the final level of performance after training was clearly associated with initial performance rather than the type of training. Thus, a teacher who is above average in the use of social skills in the classroom before training is likely to remain above average after training regardless of gains or losses during training. Nevertheless, training in the analysis of teacher behavior produces changes in spontaneous classroom behavior along lines consistent with the objectives of training. This last statement is limited by the observation that this study did not show whether the amount of progress made in training was clearly different from the progress one might expect with no training.

One of the interesting outcomes was that teachers who are initially quite direct and inflexible, as compared to their fellow teachers, can make progress in the increased use of social skills while teaching.

Chapter Five

THE FIVE SOUND FILMSTRIPS

The Content of the Filmstrips

Five filmstrips were written and produced for use as audio-visual aids. These filmstrips are highly specialized and are appropriate only to an inservice training program in which interaction analysis is used as a training tool.

The first filmstrip is designed for use on the first meeting of an inservice training course. The main objective of this filmstrip is to set the stage for considering the teachers' attitudes and feelings about inservice training so that they can be recognized and used constructively in subsequent meetings. The first part, which has 33 frames, consists of five interviews with teachers which illustrate a variety of skeptical or negative reactions to former inservice training activities. The second part, which has 23 frames, consists of a sixth interview with a teacher who "got a lot out of her last inservice training course" and ends with a "bill of teachers' rights" which emphasizes the individuality of each teacher's style and the importance of developing his own unique style.

This first filmstrip is highly specialized in that it was designed for use in the first session of an inservice training course. The first part was shown to prepare teachers for a half-hour group discussion in which they tried to list their present attitudes toward inservice training courses and to predict the consequences of such attitudes for future participation in this program. Following such group meetings the instructor discussed these attitudes with the total group and attempted to deal realistically, yet constructively, with all attitudes expressed. After the small group meetings, and the total group discussion led by the instructor, the second part of the first filmstrip was shown.

The second filmstrip, consisting of 36 frames, illustrates certain concepts of verbal influence which are useful in analyzing this aspect of teacher behavior. It opens with a scene which illustrates verbal domination by one person. Next, the narrator emphasizes that a person can expand or restrict the freedom of another by exercizing self-control over his own verbal participation. The ideas of lecturing and asking questions are then introduced as two ways of controlling student participation in the classroom. Additional concepts include "direct and indirect influence", "dependent-prone and independent-prone students" and "clear and unclear learning goals". The filmstrip ends with a brief suggestion that teachers may wish to vary their indirect and direct influence according to the dependence or independence of their students, and according to the clarity or lack of clarity of their students' perceptions of the learning goals.

The third filmstrip, consisting of 41 frames, introduced the possibility of using interaction analysis to quantify patterns of teacher influence. All ten categories of verbal communication are described and illustrated by the use of classroom incidents. These categories are listed in Table 1.1 of this report. The idea that feedback will permit a teacher to look at his own behavior and compare it with his intentions is also introduced.

The fourth filmstrip, consisting of 42 frames, introduces the procedures of tabulating an interaction analysis matrix. This is followed by an outline of various interpretations which can be made from a completed matrix.

The fifth filmstrip, consisting of 35 frames, is divided into four parts. The first part consists of the narrator's brief introduction of a 27 minute recording of teacher-pupil planning in a ninth grade social studies class. The procedure of selective re-enforcement is introduced.

Part two consists of the unrehearsed recording of this ninth grade class. The third part consists of a series of flashbacks which illustrate certain patterns of teacher influence which occurred in the teacher-pupil planning session. The filmstrip ends with an analysis of the interaction matrix for the 27 minute recording.

The Use of the Filmstrips in the Present Project

The five filmstrips were used in the same way and at the same times in both the Monday and Saturday groups. The first filmstrip was used in the first session as an audio-visual aid to help identify the initial attitudes of the teachers. The second and third filmstrips were presented at the second meeting of the groups, after all teachers (who wanted to) had read some of the materials on interaction analysis which were handed out at the end of the first session. Thus, filmstrips two and three were used as an aid to review. Filmstrip four was used at the third session which was a busy four-hour period of learning how to tabulate and interpret matrices. Filmstrip five was presented at the fourth session.

Teacher ratings of the filmstrips were recorded on the PMRS forms at the end of all meetings during the entire program. The ratings of the first four weeks can be considered immediate reactions to the filmstrips. The ratings of the second five weeks can be considered recall ratings, that is, teachers saw each filmstrip only once and after the fourth meeting their ratings were based on memory only.

Teacher Evaluation of the Filmstrips

The ratings given both filmstrips and staff lecture-discussions for the first four weeks and the remaining five weeks are shown in Table 5.1 which is taken from Table 3.7, page 70. During the first four weeks filmstrip presentations received slightly lower ratings than lecture-discussions led by the instructor. Reference to Table 3.7 also shows that ratings of the filmstrips were also slightly lower than demonstrations, role playing, or panel discussions and group discussions held during the regular sessions.

Table 5.1

IMMEDIATE AND RECALL RATINGS OF TEACHERS GIVEN TO THE FILMSTRIPS AND STAFF LECTURES OR DISCUSSION

Item	Group	First four weeks		Remaining five weeks	
		Mean Evaluation (a)	K-S Test (b)	Mean Evaluation (a)	K-S Test (b)
Filmstrips	Saturday (indirect)	5.55	$X^2 = 1.87$ N.S.	5.67	$X^2 = 58.16$ $< .001$
	Monday (direct)	5.04		2.07	
Lectures and talks given by the staff	Saturday (indirect)	7.05	$X^2 = 1.97$ N.S.	6.87	$X^2 = 9.73$ $< .01 > .001$
	Monday (direct)	6.76		5.91	

(a) Scale: Range from 1 (lowest score) to 10 (highest score)

(b) Kolmogorov-Smirnov Test of Significance at 2 degrees of freedom.

While the differences among ratings is not great, the trend of teachers' preferences for activities in which they play, or could play, a more active part is unmistakable. These filmstrips provide useful information and have definite value for an inservice program which makes use of interaction analysis as a tool for helping teachers understand their own classroom behavior. The filmstrips will be perceived as more useful by the teachers if their presentations are carefully integrated into a program of activities, such as group discussions or role playing, in which teachers take a more active part.

During the last five week period, the recall ratings of the five filmstrips became much lower in the Monday group and edged up slightly higher in the Saturday group. There is also a decrease in the Monday ratings of lecture-discussions by the staff, but this is smaller than the filmstrip decrease. In the light of the evidence presented in the earlier chapters, this deterioration, or process of disenchantment, in the Monday teachers' ratings of the filmstrips is obviously associated with the general socio-emotional atmosphere of this group. It is possible that the lecture-discussion ratings did not decrease as much as the filmstrip ratings because lecturing occurred at each session and, consequently, the projection of a Monday teacher's general reaction to the filmstrips was less oriented to reality. In other words, during the latter weeks of the program a Monday teacher's rating of the filmstrips was based on recall and they could project their more negative feelings onto the filmstrips. This demonstrates that the ratings of an audio-visual aid can be significantly influenced by the general atmosphere of the group making the rating, especially when such ratings are based on recall.

The Staff Evaluation of the Filmstrips

The statements to be made in this section are purely subjective, but they are based on using the filmstrips in more than 50 presentations, to audiences exceeding several thousand people, in short-courses and programs in more than a dozen states. Incidentally, over 30 copies of the set of five filmstrips have been sold at cost to individuals in various parts of the country. The filmstrips have been used most extensively in Minnesota, Wisconsin, Michigan, Oregon, Illinois, and Pennsylvania.

The first filmstrip has the most limited use. It was designed to stimulate group discussion of teachers' feelings and attitudes toward inservice training. The original strategy in writing the filmstrip was that the teacher interviews in the filmstrip would free teachers to express negative attitudes if they were present. The filmstrip does stimulate teachers to express their opinions and attitudes, but those of us who have used this filmstrip are disposed to think that teachers in an audience disapprove of what the teachers in the filmstrips say. The teachers who see the filmstrip express their own opinions to counteract what is said in the filmstrip and only in this sense are teachers freed to express their own opinions.

The second, third, and fourth filmstrips are more straightforward presentations of concepts and techniques for assessing teacher influence by the use of interaction analysis. Thus they can be used to supplement demonstrations and lectures or they can be used as an aid to review.

The fifth filmstrip is too long. It has often been used by presenting certain segments for particular purposes. For example, the last section, after the 27 minute tape recording, helps to illustrate relationships between a completed matrix and certain patterns of teacher influence in teacher-pupil planning. Additional filmstrips in secondary school topics other than social studies are needed to increase the identification of mathematics, science, and other types of teachers.

By way of summary, it must be pointed out that the five filmstrips cannot be evaluated in any absolute sense. We have shown here that teacher ratings of the filmstrips are influenced by factors other than the filmstrips themselves. In other words, how the filmstrips are used, the conditions of audience presentations, and the general morale of the group will determine the degree of success or failure achieved.

Chapter Six

SUMMARY, CONCLUSIONS AND IMPLICATIONS

The Objectives

Two objectives were proposed in this study: first, five sound filmstrips were to be produced as audio-visual aids for the inservice training of teachers; and second, an inservice training program was to be evaluated in terms of changes in the spontaneous behavior of teachers. The latter objective was the more difficult because the technique of interaction analysis served both as a training tool and a method of evaluating behavior changes. In addition, there were the usual research problems such as: working within a school system that was organized to teach pupils not to conduct research; working with volunteer teachers who were already very busy people; training and co-ordinating volunteer research staff members; gaining psychological, as well as physical, access to classrooms; tabulating in excess of 300,000 bits of interaction; scoring some 9,000 student attitude inventories; and similar problems.

Another view of this study places it at the end of an eight year program of research and development concerned with quantifying spontaneous verbal interaction in the classroom. Earlier research showed that certain patterns of teacher influence could be associated with higher student achievement and more positive attitudes in a way that was consistent with a developing theory of teacher influence. Yet a question remained as to whether interaction analysis could be used as a training tool to feedback information to a teacher in a constructive fashion. Could the discrepancy between the intentions of a teacher and his actions be reduced? Could a professional atmosphere of experimentation be created in which the object of inquiry was the teacher's own behavior? Would this experimentation lead teachers into more flexible and indirect patterns of influence?

Finally, could two different inservice training programs be created merely by controlling the overt behavior of the inservice training instructor? This last question was to be investigated within the limitations of reasonable, current practices. Nothing would be accomplished by contrasting an insincere, deceptive, and psychologically unsound method of training with a sincere, straightforward, and psychologically sound method. Instead, the contrast was between what might be called a typical, instructor-directed, adult education method of instruction such as exists in most education courses, with a second method which gave more attention to ideas expressed by teachers and found ways of integrating the comments of teachers into the training activities. Comparing the two programs permitted us to ask, the question, "What differences would result when the inservice training instructor clarified the ideas of teachers more often and asked more broad questions to elicit the expression of opinion?" Would these differences be consistent with the results found in the analysis of classroom interaction at lower age levels?

The Procedure

Fifty-one teachers were observed in the fall to obtain a before-training assessment of their spontaneous patterns of verbal influence. Then, during the winter, they participated in a nine-week inservice training program in which they learned to assess their own patterns of verbal influence, to experiment with different patterns, and to try and establish principles of teacher influence from their own experimentation. After training they were again observed in the spring to see if any new understandings were being applied in their own classrooms. Pupil attitudes were assessed in one morning and one afternoon class of each teacher in the fall, again at the end of the training, and later on in the spring to see if the pupils could detect any difference in patterns of teaching.

The 51 teachers were divided into two groups. The group which met on Saturdays was exposed to a pattern of instructor behavior which stimulated more verbal participation on the part of the teachers. The group which met on Mondays were exposed to a more typical lecture-discussion method of instruction. The perceptions of all teachers were collected on post-meeting-reaction-sheets at the end of every session. The differences in the behavior of the instructor, as he taught in the two programs, were analyzed by the use of interaction analysis.

A control group of 12 teachers, who did not participate in the training, was observed in the fall and spring. Their students in one morning and one afternoon class completed the same attitude inventory in the fall and in the spring. Unfortunately this group proved to be too small and did not produce stable measures of interaction analysis. Comparisons between the experimental programs and the control group were not feasible.

The five sound filmstrips were used during the first four weeks of the program and teacher ratings of their effectiveness were collected during the entire nine-week training period.

The Conclusions

Teachers who were classified as more indirect on the basis of the fall observations were quite sensitive to the differences in the two programs. In the Saturday program they were more satisfied with the training, they engaged in more experimentation in their own classrooms, and showed evidence of applying more indirect patterns of teacher influence in their own classrooms, when spring observations are compared with fall observations. The reverse patterns were true of initially indirect teachers who were in the Monday group. All of these differences were much larger than would be expected by chance.

Teachers who were classified as more direct on the basis of the fall observations were less sensitive to the differences in the two programs. In terms of change from the fall to spring observations, the initially direct teachers, as a group, made progress in becoming more indirect, but the differences between the Saturday and Monday programs were so small that they could have occurred by chance. The initially direct teachers in both groups made changes from fall to spring, that were significantly higher than the more indirect teachers exposed to the Monday program. The more direct teachers in the Saturday group were more satisfied with the training and engaged in more experimentation in their own classrooms than did their counterparts in the Monday group. All of the above was accomplished in spite of the fact that the more direct teachers in the Saturday group contained a higher proportion of the most direct and most inflexible teachers, based on the fall observations.

It was shown that the teachers in both groups evaluated their training programs as superior to education courses that they had taken in the past.

There were no significant differences between the ratings given to the filmstrips by the Saturday and Monday groups during the first four weeks which was the period in which the filmstrips were presented. However, during the remaining five weeks of the program, when the filmstrips were not used, the ratings given the filmstrips by the Monday group were much lower than their initial ratings, and also much lower than the recall ratings of the Saturday teachers during the same period.

An analysis of the perceptions of the teachers at the end of seven of the nine regularly scheduled inservice meetings showed changes in perceptions of what occurred, what they would have preferred, and fit a pattern of increasing dependence on the guidance of the instructor. In the Saturday group, the trend was toward increased independence. This was particularly true during the middle work period when teachers had the opportunity to direct their own classroom experimentation and apply what they had learned to their own classrooms. When it became necessary for a substitute instructor to replace the regular inservice training instructor, on the seventh regularly scheduled session, his inability to maintain consistent role differences between the Monday and Saturday groups was clearly reflected in the perceptions of the teachers. This accidental change in the control of the experimental design increased the confidence that can be placed on the validity of the post-meeting-reaction-sheet instrument administered to the teachers.

Relationships Between the Inservice Conclusions and Conclusions of Earlier Studies

In an earlier study of seventh grade combined English-social studies and eighth grade mathematics classes (Flanders, 1962), a number of conclusions were reached concerning how patterns of teacher influence affected pupil achievement and attitudes. In even earlier studies, in both Minnesota and New Zealand, theoretically consistent results were found between patterns of teacher influence and pupil attitudes. Thus, consistent results have been found in elementary, junior high, and senior high school classes. Since the present project is the first to involve interaction analysis using adults as the "pupils", some comparisons will be made between these related projects.

In the earliest projects the procedure was to administer a pupil attitude inventory to a sample of classrooms at a given age level and place the resulting class averages into a frequency distribution from high to low. Five or six classes at the top and bottom of the distribution were then selected for observation with interaction analysis. Differences within matrices which were found when the top classrooms were contrasted with the bottom were quite similar to the differences between the Saturday and Monday inservice training programs. At all age levels tested in the public schools, the results were consistent: the higher average scores on the inventory of constructive pupil attitudes occurred in classes in which the teacher was more indirect. Thus, the present project involving adults as pupils, now extends this generalization to adult education classes. The higher average PMRS scores of the Saturday group is consistent with this earlier trend.

In the more recent study involving measures of content achievement, consistent results were again found with patterns of teacher influence. In classrooms in which the teacher was more flexible and thus more indirect, both attitudes and content achievement scores were superior. The present inservice project did not include an analysis of the flexibility of the instructor's behavior, this was postponed for subsequent analysis, but the matrix for the Saturday group does include more sustained clarification of the teachers' (as pupils) ideas, just as was true of the more flexible junior high school teachers of mathematics and combined English-social studies. If one accepts the increased work that is involved in scheduling observations and joining teams for personal experimentation as the equivalent of "content achievement" in an inservice training program, then the results of the present project are consistent with previous research regarding school achievement.

Previous research tended not to support the proposition that different types of students would gain more or less from contrasting patterns of teacher influence. For example, it was predicted that the more dependent-prone junior high school pupils would show more gain in achievement and attitude scores than would the less dependent-prone, when both were exposed to an indirect pattern of teacher influence. The reverse relationship was predicted for more direct patterns of teacher influence. These predictions were not supported clearly in the earlier research, on the other hand, they were not rejected. It is interesting to note that the different types of teachers, i.e., those classified as initially direct or indirect, did not clearly support reverse trends when gain in I/D ratio was used as a measure of progress.

The results of this project involving adults seems unusually consistent with the theory, but not with the results, of the research with younger learners. In the junior high school classes, students scoring high or low on a test of dependence proneness did not make significantly different gains of achievement when exposed to more direct and less direct teachers. Similarly, our more direct teachers were not significantly different in their reactions to the two types of instructor behavior, while the more indirect teachers were reacting differently. In both studies a general superiority of the more indirect patterns of influence was present. Further research with younger learners may yet support the differential results of the inservice training outcomes. With greater control of teacher influence patterns and better tests for identifying personality traits among learners, the predicted results for younger learners may yet be supported.

The similarities between the inservice training project and earlier research with younger learners raise some serious questions about methods of teaching at the adult level. Most college instructors, for example, justify fairly rigid patterns of lecturing on the basis of the greater maturity, motivation, and resourcefulness of their adult pupils. More recently, some experiments have been made to see if attending traditional college courses will produce different learning outcomes compared with TV courses, the use of programmed materials, and programs of directed reading in the library. It is too early to reach any conclusions, but the early returns indicate that college professors may be in for a rude shock.

The more some kind of behavior performance enters into the stated objectives of education, as in chemistry, engineering, medicine, clinical psychology, not to overlook teacher preparation, the more laboratory or directed field experiences can be found in the college curricula. The results of this study would support this curriculum tendency and would also question the efficacy of sustained lecturing as a method of instruction at adult age levels.

The Implications of the Research

In these concluding remarks, attention will focus on the basic problem of how a person alters his classroom behavior in an effort to improve instruction.

Implications for a Model of Training.

One implication of this research is that it illustrates a model of inservice training that has much wider application than our former, relatively narrow, interest in the improvement of teacher social skills. This model, in simplest terms, involves creating a feedback loop in order to provide information which can be used to determine whether one's actions are on target or off target. Severe technical problems arise when the action is spontaneous, overt, verbal behavior by a teacher and when the target is creating a particular, desired state of affairs in the complex, social system of a classroom. Looking back over our training efforts, it is evident that this model can now be described more clearly than was true when we first began our planning.

(1) Teachers need new concepts as tools for thinking about their behavior and the consequences of their behavior. These concepts must be molded into a theory of teacher influence in order to be useful. Both types of concepts are equally necessary: those for describing actions and those for describing consequences.

(2) Procedures for quantifying both types of concepts in practical classroom situations must be developed. Not only must the frequency of events be recorded, but information about the sequence of events is also necessary. Not only must the frequency of pupil reactions be recorded, but what was being reacted to must also be known.

(3) Inservice training activities can consist of practice in using the concepts to analyze classroom interaction, practicing the skills necessary to quantify these concepts, and discussions designed to establish an atmosphere in which these new tools for the improvement of instruction can be fully utilized.

(4) The application phase of training can consist of designing experiments which teachers can carry out in their own classrooms and which will provide information necessary to develop cause-and-effect principles of teacher influence. Hopefully, teachers will reach conclusions about their own behavior of this general type: "When I do . . A and B, under conditions. . C and D, then I can expect . . E and F." Naturally these individual or team experiences can take on greater significance if they are presented, discussed, and compared with the similar experiences of other teachers.

(5) Principles of teacher influence should be discovered by teachers on the basis of their own experimentation. The effectiveness of the training experience depends on successfully creating opportunities for independent, self-directed inquiry in which one's own behavior and the reactions of pupils are the object of inquiry.

The particular categories that were used in this study to assess the use of certain social skills in the classroom need not be a limitation to this general model. The procedures of observation and matrix tabulation can serve equally well in a training program with a different purpose, providing the necessary changes are made in the observation categories. The matrix itself provides that essential dimension of event sequence which helps to identify cause and effect.

Implications for Existing Practices of Inservice Training.

This study did not include a survey of existing practices which occur under the general heading of inservice training, but the review of the literature and our personal experiences argue that present practice bears little relationship to the model proposed in the previous section. At worst, teachers hear a speech once or twice a year and attend a professional convention. At best, teachers gather together for a week before the fall semester begins to work on the improvement of instruction. In rare instances which are magnificent exceptions, the improvement of instruction becomes an integral part of the teacher's professional world, a regularly scheduled activity with support and resources provided by the administration.

After working on this project for three years, we are prepared to defend the proposition that educators have not yet really come to grips with the problem of helping teachers change their methods of instruction. What are the intellectual and emotional conditions necessary for a teacher to make changes? How can a teacher discover whether changes result in improvements? Below are some rather bold assertions, related to these questions, which we think are supported in some degree by the experiences we have had in conducting this research.

(1) Learning new ideas about teaching evokes emotional reactions and shifts in attitudes. A training program which permits these changes and reactions to be identified and interpreted as a legitimate part of the problem of improving instruction is more likely to produce desired changes in teacher behavior.

(2) The methods of training used in an inservice program should be consistent with the principles of teaching being learned. Investigating

how teachers can create more independence in their own classrooms under a relatively rigid pattern of inservice instructor dominance creates an inconsistency which will interfere with learning.

(3) Teachers in an inservice training course develop patterns of dependence or independence in much the same fashion as do students in the classroom.

(4) Inservice training programs can provide the conceptual and procedural tools necessary for teachers to experiment with their own teaching methods. Principles learned without such personal verification are less likely to be put into practice, however well they may be learned.

(5) Teachers who already are above average in applying skillful and flexible patterns of teacher influence are likely to be most dissatisfied with inflexible patterns of inservice training.

Implications for Preservice Teacher Preparation.

There has long been an unfortunate and, to our way of thinking, unnecessary dichotomy between theory and application in the preparation of teachers. Normally, student teaching, youth work, and various observation exercizes are classified as field experiences while the study of subject matter, methods, learning theory, individual differences, tests and measurements, and similar topics are classified as theory.

In the present project there was a concious effort to eliminate this dichotomy. Concepts, hypotheses and theories about teacher influence were dramatized by role playing demonstrations, by analyzing tape recordings, and, in as many ways as possible, helping teachers experience ideas as well as talk about them. Under these circumstances the distinction between theory and field applications tended to disappear.

The experience of conducting this project has focussed our attention more strongly than ever on the possibility that most education students need training in the control of their own behavior, they need to learn methods of collecting data about their own behavior, they need to learn how to use tools for collecting reliable information about the reactions of students to their behavior, and they need to practice all of these skills before they begin their practice teaching.

After observing the very personal reactions of experienced teachers trying out new methods of instruction, we find it more difficult than ever to imagine how the increased use of closed-circuit TV viewing of demonstrations can deal efficiently with the problems of teacher preparation. TV projects in which kinescopes are made of the individual student teacher may have much to offer, but the more passive viewing of demonstrations seems inadequate. The limitations of vicarious learning in the field of teaching can be well expressed by paraphrasing Kurt Lewin, "Knowledge about methods of instruction in no way assures its application in spontaneous interaction."

The day may come in which education students will learn systems for quantifying spontaneous behavior. With this tool they can make more objective and reliable observations of their own behavior and the behavior of their fellow students. They may be able to explore and discover some principles of teacher influence. They might even go to their first practice teaching assignment as a team of two. While one teaches, the other collects data and then the roles are reversed. Finally, supervizing teachers may also develop these skills and be in a much stronger position to communicate effectively with their aspiring and perspiring charges.

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APPENDIX A

This appendix contains the following data:

Initial population comparisons of the training groups, which were not included in the body of this report.

Composite Interaction Analysis Matrices of the instructor for both training groups (raw data).

Composite Interaction Analysis Matrices for both experimental and control groups, spring and fall. (Converted to a base of 1000).

Composite Interaction Analysis Matrices for spring of both training groups who perceived the training consistently and inconsistently. (Converted to a base of 1000).

Table A.1

EXPERIMENTAL GROUP RESULTS ON 16 PF MEDIAN SPLIT

Scale → / Group ↓	Cyclothymia A	High Ego Strength C	Dominance E	Surgency F	Parmia H	Protension L	Radicalism Q_1	Self-Sufficiency Q_2
Saturday Above Median	11	11	8	11	9	10	14	7
Saturday Below Median	13	8	14 [a]	11	14 [b]	11	8	13
Monday Above Median	14	9	16	14	16	15	11	14
Monday Below Median	11	15	9	11	10	9	10	11
Median for Both Groups	19	35	26	27	30	13	19	20

a X^2 = 3.03 (> 3.8 for .05)

b X^2 = Not Significant

Table A.2

INITIAL I/D AND i/d RATIOS FOR EXPERIMENTAL GROUPS AND CONTROL GROUPS

Groups	Statistic	I/D	i/d
Saturday	Mean	.301	1.220
	Median	.235	.687
	N	25	25
Monday	Mean	.427	.957
	Median	.306	1.312
	N	26	26
Control	Mean	.376	.864
	Median	.248	.600
	N	11	11

a X^2 = Not Significant

b X^2 = Not Significant

Table A.3

INITIAL MSAI DATA FOR THE TWO EXPERIMENTAL GROUPS PLUS THE CONTROL

Group	Statistic[a]	MSAI	
		AM	PM
Saturday	Mean	212.91	215.97
	Median	219.41	214.00
	Variance	453.37	251.14
	N	25	23
Monday	Mean	218.08	214.37
	Median	214.87	213.97
	Variance	105.04	856.80
	N	25	24
Control	Mean	219.46	221.91
	Median	221.21	226.91
	Variance	308.48	148.01
	N	11	10

[a] F tests are significant > .005, therefore, t-tests are impossible. X^2 (median split) yields no significant differences between groups.

Table A.4.1

GRAND TOTAL MATRIX FOR ALL SATURDAY TRAINING CLASSES

Category	1	2	3	4	5	6	7	8	9	10	Total
1	4	0	0	0	10	0	0	0	1	1	16
2	0	10	11	12	14	1	0	0	93	7	148
3	0	3	195	11	18	3	0	2	13	7	252
4	1	7	2	63	32	4	1	70	70	31	281
5	8	56	24	102	2749	21	9	5	59	31	3064
6	0	0	1	8	15	18	0	6	14	14	76
7	0	0	0	3	6	2	7	0	0	0	18
8	0	0	5	12	26	5	1	46	47	1	143
9	2	66	12	51	147	12	0	7	1092	57	1446
10	1	6	2	19	47	10	0	7	57	65	214
Total	16	148	252	281	3064	76	18	143	1446	214	5658

Table A.4.2

GRAND TOTAL MATRIX FOR ALL MONDAY TRAINING CLASSES

Category	1	2	3	4	5	6	7	8	9	10	Total
1	4	0	0	0	10	0	1	0	1	1	17
2	0	0	3	5	6	0	0	1	66	1	82
3	0	2	56	8	8	0	0	0	12	2	88
4	0	0	0	50	25	3	1	64	35	39	217
5	13	44	9	90	4642	23	14	4	95	37	4971
6	0	2	0	0	14	23	0	0	12	11	62
7	0	0	0	1	15	1	17	0	7	1	42
8	0	2	3	13	33	0	1	16	23	2	93
9	0	30	17	29	168	6	8	0	647	12	917
10	0	2	0	21	50	6	0	8	19	87	193
Total	17	82	88	217	4971	62	42	93	917	193	6682

Table A.5.1

SATURDAY FALL, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Saturday Group, Fall Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	0	0	0	0	0	1
2	0	1	1	2	3	1	0	1	1	0	10
3	0	0	13	5	9	1	0	1	1	1	31
4	0	0	0	25	8	3	0	56	3	9	102
5	0	2	1	38	408	9	1	7	12	10	489
6	0	0	0	3	6	26	1	8	1	5	50
7	0	0	0	1	1	1	3	1	0	1	8
8	0	5	11	21	30	3	1	75	3	3	153
9	0	1	4	3	14	1	1	0	46	2	71
10	0	0	0	8	9	5	1	5	3	47	78
Total	1	10	31	102	489	50	8	153	71	78	1000

N = 68745

Table A.5.2

SATURDAY SPRING, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Saturday Group, Spring Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	1	0	0	0	0	0	2
2	0	2	2	2	3	0	0	0	2	0	14
3	0	1	23	8	14	1	0	1	4	1	54
4	0	0	0	30	6	1	0	57	6	10	111
5	0	2	1	38	388	8	1	3	11	7	459
6	0	0	0	2	5	19	1	4	1	3	35
7	0	0	0	0	1	0	2	0	0	0	5
8	1	4	17	16	20	2	0	90	8	2	161
9	0	2	10	6	12	1	0	0	74	1	108
10	0	0	0	7	9	2	0	5	2	28	54
Total	2	14	54	111	459	35	5	161	108	54	1000

N = 61129

Table A.5.3

MONDAY FALL, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Monday Group, Fall Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	0	0	0	0	0	1
2	0	2	3	2	4	1	0	1	2	0	15
3	0	1	15	7	13	1	0	2	3	0	43
4	0	0	1	29	9	3	0	61	7	10	121
5	0	3	1	45	337	9	2	7	14	7	427
6	0	0	0	2	6	20	1	6	2	5	44
7	0	0	1	1	2	1	4	1	1	1	12
8	0	5	13	21	31	38	2	116	5	3	200
9	0	2	9	5	15	1	1	0	37	1	74
10	0	0	0	7	8	4	1	6	2	31	60
Total	1	15	43	121	427	44	12	200	74	60	1000

N = 77335

Table A.5.4

MONDAY SPRING, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Monday Group, Spring Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	1	0	0	0	0	0	0	0	2
2	0	2	3	2	4	1	0	1	2	0	16
3	0	2	20	9	17	1	0	5	4	1	58
4	0	0	1	26	6	2	0	59	4	10	108
5	0	3	2	37	350	7	1	7	11	8	426
6	0	0	0	2	4	25	1	6	2	3	43
7	0	0	1	1	1	0	2	1	0	0	7
8	1	6	21	19	23	3	1	101	8	3	186
9	1	3	9	4	11	1	1	2	70	2	103
10	0	0	1	7	9	2	0	6	2	22	49
Total	2	16	58	108	426	43	7	186	103	49	1000

N = 71317

Table A.5.5

CONTROL FALL, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Control Group, Fall Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	1	0	0	0	0	0	0	0	0	0	3
2	0	1	1	2	4	1	0	0	2	0	13
3	0	0	12	3	6	0	0	0	2	0	26
4	0	0	0	27	8	2	0	60	7	10	117
5	0	3	2	44	369	13	2	12	15	8	468
6	0	0	0	2	8	23	0	12	1	8	56
7	0	0	0	0	2	0	2	1	0	0	7
8	0	6	5	25	43	8	1	76	3	4	171
9	0	2	5	4	19	1	0	0	40	1	74
10	0	0	0	7	9	6	0	8	1	35	67
Total	3	13	26	117	468	56	7	171	74	67	1000

N = 27503

Table A.5.6

CONTROL SPRING, CONVERTED TO BASE 1000

Total Matrix for Classroom Teachers, Control Group, Spring Observation

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	0	0	0	0	0	1
2	0	1	2	3	3	0	0	0	1	0	12
3	0	1	25	13	13	1	0	3	3	0	61
4	0	0	0	28	5	2	0	70	5	12	122
5	0	1	1	39	405	12	1	6	10	6	482
6	0	0	0	2	10	12	0	6	0	3	33
7	0	0	0	0	1	0	1	1	0	1	5
8	0	6	24	25	25	4	2	55	5	3	149
9	0	2	7	5	11	0	0	0	49	1	75
10	0	0	0	7	9	2	1	6	1	34	60
Total	1	12	61	122	482	33	5	149	75	60	1000

N = 28112

Table A.6.1

SATURDAY-SPRING: INITIALLY INDIRECT TEACHERS WHO PERCEIVED TRAINING AS INDIRECT, CONVERTED TO BASE 1000

Category	1	2	3	4	5	6	7	8	9	10	Total
1	.2	.6	.7	.6	.7	0.	0.	0.	.3	.1	3.4
2	.1	4.1	3.9	3.4	3.9	.7	0.	.4	1.7	1.2	19.5
3	.1	2.2	32.1	11.1	16.9	.8	.1	2.6	7.3	1.8	75.1
4	.1	.2	.3	28.1	6.1	1.2	.3	61.1	10.7	10.1	118.4
5	.4	3.4	1.3	37.3	282.3	6.1	.7	3.4	12.6	7.4	354.9
6	0.	.1	0.	1.3	3.2	10.5	.2	3.9	2.4	2.9	24.5
7	0.	0.	0.	.5	.9	.2	1.0	.2	.5	.9	4.2
8	.7	4.8	20.6	17.2	18.5	1.8	.3	85.1	10.4	2.7	162.2
9	1.6	3.3	15.6	10.1	13.4	1.3	.7	.3	131.5	3.0	180.7
10	0.	.8	.5	8.7	8.9	1.8	.9	5.2	3.2	26.5	56.6
Total	3.4	19.5	75.1	118.4	354.9	24.5	4.2	162.2	180.7	56.6	1000.

N = 20567

Table A.6.2

SATURDAY-SPRING: INITIALLY DIRECT TEACHERS WHO PERCEIVED TRAINING AS INDIRECT, CONVERTED TO BASE 1000

Category	1	2	3	4	5	6	7	8	9	10	Total
1	0.	0.	.3	.4	.8	.2	.1	.0	.0	.0	1.8
2	.1	1.6	1.5	1.4	3.0	.5	.1	.4	1.8	.2	10.4
3	.1	.4	11.3	4.9	11.3	.5	.1	.3	1.7	.3	30.9
4	0.	.2	.2	23.9	4.9	.9	.1	56.5	3.3	11.2	101.3
5	.1	1.4	1.1	41.1	444.2	9.8	.8	2.2	10.8	7.0	518.8
6	.1	.2	.1	2.7	7.4	28.9	.8	2.8	.9	3.0	47.1
7	.1	.6	.1	.3	1.1	.2	2.4	.3	.5	.4	6.1
8	1.1	3.9	10.8	16.7	22.4	2.7	.5	72.5	7.9	2.3	140.8
9	.2	2.0	5.4	4.2	14.0	.7	.5	.6	53.5	.9	82.0
10	0.	.1	.1	5.6	9.6	2.6	.6	5.0	1.6	34.4	59.6
Total	1.8	10.4	30.9	101.3	518.8	47.1	6.1	140.8	82.0	59.6	1000.

N = 29727

Table A.6.3

MONDAY-SPRING: INITIALLY INDIRECT TEACHERS WHO PERCEIVED TRAINING AS DIRECT, CONVERTED TO BASE 1000

Category	1	2	3	4	5	6	7	8	9	10	Total
1	.8	.1	.1	0.	.1	.4	.1	0.	0.	0.	1.6
2	.1	1.5	4.1	2.5	4.4	1.5	.2	.8	1.1	.5	16.6
3	0.	2.1	21.2	11.3	19.4	2.1	.3	6.3	4.0	1.3	67.9
4	0.	.4	1.8	32.6	7.3	1.7	.1	54.5	4.1	9.5	112.0
5	.1	1.8	2.0	37.2	319.4	7.8	1.0	6.0	13.0	7.9	396.4
6	.3	1.0	.3	1.7	4.7	35.8	1.4	7.0	1.8	3.4	57.4
7	.2	.2	.3	.6	1.3	.5	2.8	.5	.4	1.3	5.8
8	.1	6.8	27.6	15.5	20.0	3.1	.9	110.0	7.4	3.0	194.4
9	0.	2.5	9.6	3.8	11.1	1.4	.8	2.9	64.1	2.1	98.2
10	0.	.3	.8	6.8	8.6	3.2	.6	6.2	2.3	23.1	51.9
Total	1.6	16.6	67.9	112.0	396.4	57.4	5.8	194.4	98.2	51.9	1000.

N = 40245

Table A.6.4

MONDAY-SPRING: INITIALLY DIRECT TEACHERS WHO PERCEIVED TRAINING AS DIRECT, CONVERTED TO BASE 1000

Category	1	2	3	4	5	6	7	8	9	10	Total
1	.2	.1	2.2	.5	.2	0.	0.	.1	.1	0.	3.4
2	0.	.8	1.6	1.2	3.1	.6	.1	1.0	5.4	.5	14.5
3	0.	.3	14.5	6.5	9.4	.5	.1	.2	1.0	.2	32.8
4	.1	.2	.5	18.5	3.6	2.0	.2	74.0	2.1	10.6	111.8
5	.1	5.0	.9	40.4	388.2	9.1	1.8	9.5	9.8	4.3	469.0
6	0.	.1	0.	2.1	5.3	13.8	.5	6.6	2.5	2.6	33.5
7	.1	.2	0.	.8	2.2	.4	1.5	.9	.9	.2	7.2
8	1.6	4.2	8.6	27.2	35.2	3.5	1.7	79.8	12.0	3.4	177.2
9	1.3	3.0	4.2	7.4	15.4	1.5	.9	.1	80.2	2.0	116.1
10	.1	.5	.2	7.0	6.2	2.2	.2	5.1	2.1	12.2	35.9
Total	3.4	14.5	32.8	111.8	469.0	33.5	7.2	177.2	116.1	35.9	1000.

N = 16915

APPENDIX B

This appendix is entirely
composed of the 59 item
Minnesota Student Attitude
Inventory which was adminis-
tered at three different
times during this study.

MINNESOTA STUDENT ATTITUDE INVENTORY

This is not a test because there are no wrong answers. The answer to each question is A MATTER OF OPINION, and your true opinion, whatever it is, IS THE RIGHT ANSWER. You will be asked a lot of questions about how much you like this class, the teacher, and the work you are doing here. All the questions refer to THIS ONE CLASS AND THIS PARTICULAR TEACHER. By giving frank, true answers to show exactly how you feel, you can help us understand the opinions of students.

DIRECTIONS:
1. Please do not write your name on the answer sheet.
2. Do not skip any questions--answer each one carefully.
3. Make sure that the number on the answer sheet matches the question number when you mark your answer. Double check when you are asked.

HERE IS AN EXAMPLE

0. I think my homework is very hard.

SD--STRONGLY DISAGREE D--DISAGREE U--UNCERTAIN A--AGREE SA--STRONGLY AGREE

You have five alternatives to choose from. You might STRONGLY DISAGREE with the statement. If so, you would put an "X" in the SD box on your answer sheet, like this:

	SD	D	U	A	SA
0.	☒	☐	☐	☐	☐
	e	m	l	b	j

If you felt UNCERTAIN about the statement, you would put an "X" in the U box on your answer sheet, like this:

	SD	D	U	A	SA
0.	☐	☐	☒	☐	☐
	a	b	l	d	j

Or, for example, you might AGREE with the statement, but not STRONGLY. If so, you would put an "X" in the A box, like this:

	SD	D	U	A	SA
0.	☐	☐	☐	☒	☐
	a	m	c	b	j

Pay no attention to the little letters under the boxes on your answer sheet.

And, DO NOT WRITE ON THIS QUESTIONNAIRE BECAUSE OTHER STUDENTS WILL HAVE TO USE IT.

1. This teacher asks our opinion in planning work to be done.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

2. This teacher keeps order with a fair hand.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

3. I get along well with this teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

4. I find it easy to talk to this teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

5. This teacher never asks trick questions to show how dumb we are.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

6. Most of us get pretty bored in this class.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

7. This teacher never slaps us or handles us roughly.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

8. No one dares talk back to this teacher.
SD--STRONGLY DISAGREE D-DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

9. This teacher is one of the best I have ever had.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

10. I just don't trust this teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

11. It is easy to fool this teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

12. This teacher makes sure WE understand our work.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

13. This teacher often sends boys and girls out of the room as punishment.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

14. This teacher really understands boys and girls my age.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

15. Our teacher is very good at explaining things clearly.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

16. Frankly, we don't pay attention to this teacher.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

17. This teacher has lost the respect of the class.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

18. Sometimes things "get out of control" in this class.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

19. This teacher certainly knows what he(she) is doing.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

20. This teacher often "bawls you out" in front of the class.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

21. This teacher makes it fun to study things.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

22. This teacher has some special favorites or "teacher's pets."
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

23. Our teacher never gives us extra assignments as punishment.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

24. This teacher wants to check our work to make sure we are on the right track.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

25. I really like this class.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

26. Sometimes I think this teacher is deaf.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

27. This teacher helps us get the most out of each hour.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

28. This teacher is cool and calm.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

29. In this class we fool around a lot in spite of the teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

30. When I'm in trouble I can count on this teacher to help.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

31. This teacher becomes confused easily.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

32. This teacher will punish the whole class when he(she) can't find out who did something bad.
SD--STRONGLY DISAGREE D-DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

33. This teacher thinks clearly.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

34. Some of the students are smarter than this teacher.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

35. This teacher lets us discuss things in class.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

36. It is fun to see how much we can whisper before we get caught.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

37. This teacher makes everything seem interesting and important.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

38. I wish I could get even with this teacher.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

39. This teacher knows a lot.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

40. This teacher is quick to see a new point.
SD—STRONGLY DISAGREE D-DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

41. This teacher is too bossy.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

42. This teacher never gets angry and shouts at us.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

43. We often complain just to get out of work.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

44. If I could get away with it, I'd sure like to tell this teacher off!
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

45. This class is noisy and fools around a lot.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

46. This is the best teacher I have ever had.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

47. You can't walk around in this class without permission.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

48. It seems that somebody is always getting punished in this class.
SD—STRONGLY DISAGREE D—DISAGREE U—UNDECIDED A—AGREE SA—STRONGLY A.

49. I wish I could have this teacher next year.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

50. This teacher has lots of fun with us.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

51. Sometimes just thinking about this class makes me sick.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

52. This teacher makes very careful plans for each day's work.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

53. This teacher helps students when they have problems with their work.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

54. Frankly, we just don't obey the teacher in this class.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

55. This teacher always takes time to find out your side of a difficulty.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

56. This teacher never pushes us or shakes us in anger.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

57. This teacher punishes me for things I don't do.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

58. This teacher likes to hear students' ideas.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

59. We behave well in this class even when the teacher is out of the room.
SD--STRONGLY DISAGREE D--DISAGREE U--UNDECIDED A--AGREE SA--STRONGLY A.

APPENDIX C

This entire appendix consists of a copy of the Post Meeting Reaction Sheet which was administered to both training groups after seven out of the nine training sessions.

POST MEETING REACTION SHEET

NAME________________________ DATE__________ (Check one) SAT.___ MON.___

YOUR GENERAL REACTIONS TO ALL INSERVICE ACTIVITIES UP TO NOW: Please indicate how much you value the inservice activities that have occurred so far.

DIRECTIONS

Check one rating, between 10 and 1, for each item unless you have no evidence, in which case check the extreme right hand column.

	HIGHEST VALUE <----> LOWEST VALUE										
	Outstanding		Excellent		Good		Average		Poor		No evidence
	10	9	8	7	6	5	4	3	2	1	0
1. Demonstration, role playing, or panel discussions.											
2. Filmstrips or tape recordings											
3. Lectures and talks given by the staff.											
4. Group discussions that are part of our regular sessions											
5. Discussions with fellow teachers about inservice during the week.											
6. Your own experimentation in the classroom based on this program											
7. Work with consultant-observers.											
8. Outside reading.											

PAST SEVEN DAYS: Consider all the hours you spent on inservice training the past seven days; what per cent of this time were you directing your own activities? (The contrast here is with the time the inservice staff directed your activities.)

/ / / / / / / / /

100% 80% 60% 40% 20% 0%

Your check shows per cent of self directed activities.

GENERAL REACTIONS TO TODAY:

(1) Compared with an equal amount of time in an average education course, I would rate TODAY as follows.

/ / / / / / / / /

10 9 8 7 6 5 4 3 2 1

Magnificent very outstanding good poor very poor

(2) I would rate the material and experiences of TODAY'S session--in terms of helping me with my own teaching--as follows.

/ / / / / / / / /

10 9 8 7 6 5 4 3 2 1

Magnificent very outstanding good poor very poor

WHAT HAPPENS VERSUS WHAT YOU WOULD HAVE LIKED

All the items listed below refer to TODAY'S session and require two answers. The first answer indicates your appraisal of what happened, without regard to whether you like it or not. The second answer indicates what you would have preferred without regard to what actually happened. REMEMBER, THE FIRST INDICATES WHAT HAPPENED, THE SECOND INDICATES WHAT YOU WOULD HAVE PREFERRED.

1. Assuming that "very theoretical" is the opposite of "very practical", how would you rate TODAY's session? More theoretical? More practical?

a) Mark your appraisal of TODAY's session, as you saw it.

/ / / / / / / / /

10 9 8 7 6 5 4 3 2 1

very theoretical very practical

b) Now indicate what you would have preferred TODAY.

/ / / / / / / / /

10 9 8 7 6 5 4 3 2 1

very theoretical very practical

2. Assuming that the approach to ideas or problems before our group could be determined either by the instructor (staff) or by the teachers participating, where did the approach come from TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

from the instructor — from the teachers

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

from the instructor — from the teachers

3. Assuming that we could emphasize content (ideas about teaching) or we could emphasize attitudes (our feelings about these ideas), how would you rate the session TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

mostly ideas — mostly attitudes

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

mostly ideas — mostly attitudes

4. Assuming that the flow of ideas can move too fast for adequate understanding and, at other times, too slow for sustained interest, how did this aspect of our work TODAY appear to you?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

much too fast — much too slow

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

much too fast — much too slow

5. Assuming that some of the time the instructor controls the activities and at other times this control can be shared or given exclusively to the teachers participating, what kind of balance occurred TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

instructor directed — teacher directed

b) Now indicate what you would have preferred TODAY.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

instructor directed — teacher directed

6. Assuming that your relationships with the instructor and staff could be considered "formal and impersonal" versus "informal and personal," how would you characterize these relationships TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

very formal — very informal

b) Now indicate what you would have preferred TODAY.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

very formal — very informal

7. Assuming that your own motivation for participating could come either from the instructor's stimulation or from self-generated curiosity, what motivated you TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

mostly instructor — mostly self

b) Now indicate what you would have preferred TODAY.

____/___/___/___/___/___/___/___/___/____

10 9 8 7 6 5 4 3 2 1

mostly instructor — mostly self

8. Sometimes people feel free to "speak out" during meetings like today's, and sometimes people feel restrained against expressing their ideas and feelings. How did it go today? Did you feel free to say what you wanted, or did you feel held back?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

not free enough ... free enough

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

not free enough ... free enough

9. Assuming that any progress you may have made today could be due to instruction or to your own determination, how would you rate TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

instruction ... self-determination

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

instruction ... self-determination

10. Assuming that some materials, ideas, and skills are difficult to understand, while other materials, ideas, and skills are easier to grasp, how did you make out TODAY?

a) Mark your appraisal of TODAY's session, as you saw it.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

most difficult ... rather easy

b) Now indicate what you would have preferred TODAY.

___/___/___/___/___/___/___/___/___/___

10 9 8 7 6 5 4 3 2 1

most difficult ... rather easy

PLEASE FEEL FREE TO ADD ANY COMMENTS ABOUT THE INSERVICE PROGRAM ON THE BACK OF THIS SHEET.